The Builder.

VOL. XVII.—No. 850.

Prevention and Cure.

Industrial Schools and Reformatories.

PREVENTION is better than cure, whether with reference to morals or medicine. Individually, all would certainly agree in this, and even more certainly in the assertion that prevention is better than *no* cure, as it might be put. Nevertheless, collectively, we take little pains to show our belief in it. Let us put together a few facts bearing on this theme. Some days ago, two boys—one fifteen years of age, and the other only nine—were charged at Worship-street with being found asleep in a back building in Hoxton. The eldest of these lads said that his father was a tailor, but that he had gone off to Birmingham or elsewhere, and that he had no mother. The other boy was in a worse case still: he was a mere child, most wretched in appearance, though with good, regular features. He had neither father, mother, nor home. His father had once lived in George-street, Camden-town, but was killed on the railway while at work near Chalk Farm Tavern, and his mother had died in the Gray's-inn-lane Hospital. He had neither brothers nor sisters, nor any person in the world taking interest in him. They had both lived by begging. Mr. D'Eyncourt considering the lads deserving, ordered them to be taken for the present to the Workhouse. Here we see what unfortunately too often occurs, though it is unknown, a mere child left in this great city exposed to the temptation of hunger, and of bad companions; uninstructed, and with scarcely a chance of being put into the way of obtaining an honest living. What but the prison can be looked forward to for such. It should be some one's duty to pick these waifs and strays from the kennel, and lead them into proper courses, if we are all agreed that prevention is better than cure.

Another incident. In Farringdon vegetable Market, in the centre of the wealthy City of London, there is an unoccupied space, dimly lighted, and which offers a curious contrast with the bustle of the adjoining streets. Here, on most days, may be seen crouched in corners—sometimes groups—in other cases, solitary, specimens of the houseless and destitute. More dismal pictures than these present cannot easily be conceived. The last time we looked in, the groups consisted of two lads about twelve years of age, and three or four girls, from fourteen to sixteen. The language to be heard on passing was of a frightful character. From what tree came such fruit? Whose fault is it that a mould exists whence come such impressions? Not far off were young girls, who seemed comparatively decent, but who were also without a home. In another part was a woman nursing an infant: elsewhere, girls, women, and boys, most of them sleeping. The sun was shining brightly outside, but here the unfortunates—like owls and bats—had sought the dusky shelter.

Some of the girls had slept in the casual wards of workhouses, and had been turned out upon the streets penniless early in the morning. One said she had walked about the streets the whole night, driven from place to place by the police; and others told sad tales, which might be more or less true. In either case here were destitute, untaught, unaided, unadvised creatures, verging on womanhood, exposed to temptations, which must sadden all who will think of the matter. What is there to prevent their falling into crime? Good principles? Who has implanted them? Fear of the sinking in the opinion of those about them? They know none about them but outcasts like themselves, who have probably already fallen. Can nothing be done to change their course? Prevention is certainly better than cure! and cheaper too!

Scattered over the town there are a few Industrial Schools and Reformatories, the first for prevention, the second for cure; but these are insufficient to reach the mass, and are not supported as they should be, few as they are. It is said, too, that Government propose to withdraw, in certain cases, the grants of money which have contributed to the success of many of them. Considering the good which has already been effected, and the promise of still further benefits held out for the future, it is to be hoped that, in this instance, report may not speak truly. The withdrawal of the Government assistance would probably lead to the closing of some of these establishments, even now labouring under pecuniary difficulties. Not long since an Act was passed by the Legislature, the chief object of which was the maintenance and training of vagrant, destitute children, who were in danger of becoming, as criminals, a permanent public burden. In the belief that it was better to pay 15*l.* a year for a child, with the chance and hope of making him a useful member of society, instead of 30*l.* for an adult criminal, it was determined to grant from the public purse a share of the expense of Industrial Schools. Touching this, Mr. G. W. Bell, a gentleman who has given the subject much attention, says:—

"I believe, with regard to the Government aid, all who have paid attention to the working of this law are convinced that the Government pecuniary assistance is too small. Beyond the half rent, and an allowance for tools and raw material, the amount of which is no criterion of the usefulness of the school, the Government contribution is five shillings a head per annum, except in the case of boys amenable to the Vagrant Act, and sent to the Industrial School by a justice of the peace. For these an allowance of 5*l.* each is made."

As at present constituted, the Industrial Schools depend for their support,—

1st. On Government aid;

2nd. The remunerative work of the children;

3rd. The enforced contributions of parents; and,

4th. The voluntary subscriptions of benevolent individuals.

Mr. Bell remarks that remunerative works thus become, from necessity, a matter of undue importance—undue, because it is highly desirable that, until each inmate of the Industrial School has passed through the settled routine, training, and discipline of those establishments, he should not be drafted into the self-supporting class. The contributions of parents are not generally to be depended on.

In order to show the working of these schools, let us walk into "The Boys' Home," an institution for the training and maintenance, by their own labour, of destitute boys, *not convicted of crime*. This Home was the first established under the Industrial Schools Act, and was commenced, where it now is, at No. 44, Euston-road, near King's Cross—a ten-roomed house, containing 22,000 cubic feet, and having a yard of 3,600 feet area.

The care of this establishment is entrusted to an efficient master, who for many years has been a sergeant in Her Majesty's 38th regiment. There are now 36 boys in it, of ages varying from 6 to 16. A number of the boys, some time ago, were employed in out-door work—some at a type-founder's—others at carpenters' and bricklayers'—one at a hatter's—some at news-agents' and chemists'; and it is satisfactory to learn that these lads, who but for this Home would have been either ragged wanderers in the streets or the inmates of prisons, were well spoken of by their employers. Just now only two are employed out of doors. The boys are provided with clothes for Sundays and for working-days, and are well looked after. Their condition, at the time of their admission here, is, in most instances, deplorable—covered with dirt—in rags and misery.

Inquiring into the position of some of the inmates at the time they were admitted, we found that one, a fine, handsome-looking youth, sixteen years of age, had not been here many weeks. He had been left almost from infancy without father or mother; he had no relations or any one to care for him; had suffered all kinds of privations, but had, nevertheless, kept clear of prison. He obtained employment as a shoe-black; but became, as he told us, too big for that, could not find any other employment, and fell into starvation: his body was covered with sores, and nothing could be more desolate than the condition of this youth, just verging on manhood. The change made in his appearance in a short time is remarkable, and it is likely that before long he will be turned into a smart soldier, having a fancy for the service.

Another lad, born and bred at Croydon, where both his parents died of cholera, was about fourteen years of age. Too old to go willingly to the workhouse, and having no relatives who would receive him, he wandered to London, fell in with other boys, begged, shivered, rested under arches, starved, and generally led the life of the vagrants among whom he was cast. Eventually he found his way to the Field-lane Refuge, the master of which sent him to this Home. Casual help, in this instance, would have been of no avail, and but for some comparatively permanent stay and support, the boy must have been ruined. How it is he was not is a puzzle. This case was received gratuitously, and the boy was then earning 7*s.* a week at a hatter's in London—residing still at the Boys' Home. Placed under the same circumstances, and exposed to the same temptations, some who are now lights of the world might have fallen.

In another instance, a gentleman's coachman died, leaving his widow helpless with a son. She had been a cook, but with the burden of the boy could get no situation. On applying for parochial relief, the mother was told that she and the boy might "enter the house." A lady, who kindly interested herself on behalf of the widow, obtained for her a situation of 16*l.* a year, and instead of mother and son becoming paupers, the boy is now maintained in this establishment by the honest labour of the mother.

Take another case: a lad, aged fourteen, the son of a widow in London, was sent, at his own request, on board the flag-ship at Portsmouth, in which he served for eight months: at the end of that time, not being considered strong enough for sea life, he was put ashore with 2*l.* in his pocket, and his railway-fare paid up to London. Arrived there, he found his mother dead. Helpless, and without a home in this vast wilderness, he soon spent his little earnings, and wandered from house to house in search of work. He was sent to this institution by a subscriber, who found him in the street, hungry, ragged, and in despair. After being several months at the Euston-road, and showing himself a steady, willing, and grateful lad, he was sent to a situation which enables him to earn his own living. The greater number of the boys here have been in a similarly destitute condition.

Industry and order are strictly enforced; a proper hour is appointed for every thing, and while the lads are taught to work, a course of religious and moral education is going on. Some of the smaller and weaker boys are put to tailoring and needle-work. They are taught to wash and mend their own clothes; asist in cleaning the rooms, windows, and furniture; and in cooking their meals; and some are employed in carpentery and fire-wood chopping.

To show the need of both the Government and voluntary aid, it may be mentioned that the probable expense of rent, salaries, maintenance, and tuition for twenty-five boys, will be about 500*l.* a year:—

The in-door labour should produce	£50	a year.
The boys' wages (who are engaged out) ..	150	do.
The payment from parents and others	50	do.
	250	

At present but few commitments of desti-

tute boys have been made by magistrates: any child sent under the Act to an Industrial School by a magistrate, must be legally a vagrant; yet a vagrant child, not liable to be convicted and sent to a reformatory, is consigned to the next workhouse. The operations of this part of the Act seem to be ineffectual, and thus the Government are not called upon to contribute 5*l.* a-year each towards the support of boys committed under those circumstances. It turns out, therefore, that the Government aid to a school, such as has been mentioned, will scarcely amount to 50*l.* a-year; but even this sum is a consideration in some cases, and it is well worthy of thought whether it will not be more beneficial to increase this sum, than to take the whole away. For such a school as that in Euston-road, it becomes necessary, besides other means of support, to raise yearly 200*l.* by voluntary contributions, and this is not easy. As Mr. Bell remarks,—"The fearful accidents which remind the public constantly of the value of our hospitals—the exciting reports of disease—the thrilling records of unfortunate crime, which have sometimes rendered the phrase of 'pet criminal' not altogether undeserved, all these materially assist the funds of other institutions, keeping them prominently before the public eye, and opening freely the public purse. To this highly remunerative public interest, the Industrial School can owe but little help: its value is a negative one—it prevents crime, and withdraws idleness and sin from the public gaze. Those who will take the trouble to inquire into, and who will examine for themselves the working of those schools, rarely fail to appreciate their large and extensive usefulness. But the actual visitors here are comparatively few, and the even tenor and silent working of the Industrial Schools, while weeding the streets of their reclaimable vagabonds, will remain comparatively unnoticed, because by their practical working, the Industrial schools will remove the most obvious inducements to public generosity."

The cleanliness of the house, and other arrangements, reflect great credit on Sergeant Rayment, the master, who appears to rule with firmness, but with kindness. In establishments of this kind, everything depends on the head of "the family." There must be heart in the work, or there will be no hearts touched.

Even more so is this the case in the institutions which have been opened to attempt the cure of those who have fallen, the necessity for which, we are satisfied, will become less as the numbers of those first described, under proper management, become greater. We have but to walk a short distance in the same thoroughfare, Euston-road, and we shall find, near Tottenham-court-road, a Reformatory, known as the London Preventive Institution, where about 100 lads and young men are lodged, fed, and taught some useful trade. These are literally all brands from the burning. Nearly all of them have been convicted, and but for the means of gradual retrieval here offered to them, would be preying upon society, and falling lower and lower in crime. The frontage of the institution towards Euston-road is only that of an ordinary shop, where the fancy furniture and other things made within, are sold. But behind, the premises are large, including a number of workshops and other buildings, erected round a yard. The trades taught are turning, cabinet-making, and joinery, printing, bookbinding, smiths' work, French polishing, tailoring, and shoemaking. Each department is presided over by a competent workman. In the smiths' shop, there were sixteen lads; in the tailoring and shoemaking, eighteen, and so on. Nearly all the inmates whom we saw busily occupied on those various works, had become tired of crime. Most of them had been left in early life without the care of parents, or with parents who were worse than none. They had no chance of doing well; scarcely any knew a trade, and they fell almost as a matter of course to thieving. The number who can be received here is but a tithe of those who make application for admission. One of the chief causes of a large amount of crime in towns, is the want of means of getting honest employment after leaving the prisons. We have sometimes seen groups at the door of a prison waiting for those whose term of confinement had expired. Some are welcomed by decent persons who, with tears in their eyes, have taken the offender to a home, and given him a chance of reformation, but these are few. Others have been met by thievish companions, and welcomed to their old way of life. Others have had no living creature to care for them, and have slunk away to fare just as it may happen. However good may be their intentions, they have no chance of doing otherwise than evil.

We found that a considerable number of the inmates of the Reformatory had been recommended by the chaplains of prisons, and this is one of the chief uses of reformatory establishments, that after a course of prison discipline, those who are dismissed and have no means of obtaining a proper livelihood may be strengthened by training, and put into the way of making an honest living.

It is satisfactory to learn that the accounts from the large number of youths who have passed through the regular term of instruction here are satisfactory. As is the case in all those institutions which have been attended with benefit, the stay of each is voluntary, and this is the great advantage which the reformatory has over the prison. In the former the inmates see a chance of becoming useful members of society, and feel that they are bound in honour to endeavour to do right. It appears that during the first two or three weeks after admission some few who enter leave, but those who get over that time become accustomed to the regulations, and set earnestly to work to acquire such a trade as they may have chosen to learn. The time appointed for this purpose is twelve months, and during that period the lads have generally acquired so much skill as to be useful, and are then assisted with the means of emigration to some suitable colony.

The cost of the reformatory is considerable. Those who have lived a year in such establishments are beginning to work profitably, but aid is wanted from without. The dormitories are unoccupied during the day, and although the quantity of air admitted at night through the various openings is very great in comparison with the chief of the metropolitan barracks, we hear no complaints of colds, or of those diseases of the respiratory organs which have been so fatal amongst soldiers.

A chapel, which is also used as a school and lecture-room, has been recently built. The wooden rafters of the roof are illuminated with passages from Scripture, and on the walls are various useful pieces of advice. The arrangements for cooking are excellent. An apparatus has been presented by Captain Shaw, which has effected a saving of nearly 2*l.* a-week we are told, in the cost of food: this is also so arranged that the same fire serves to heat the water required in the wash-house and drying-room.

It is only six years and a half since the energetic and benevolent founder of this reformatory commenced with six boys; since then, by his unremitting exertions, after the hours and fatigue of ordinary business, this shelter has grown until there are now (independently of the superintendents) ninety-eight inmates within the walls. There is room enough for fifty more if funds could be found sufficient for their support.

We would strongly urge those who feel an interest in this matter to pay a visit to the establishment, in order to form a judgment of its usefulness, and to see in what way needful help can be given. A meeting was held there on Tuesday last to encourage, with good wishes, twelve of the inmates who are about to emigrate. Prevention is better than cure, but the means of cure must be also cared for.

FATAL ACCIDENT AT GLOUCESTER CATHEDRAL.—In repairing the great west window of this cathedral, preparatory to filling it with stained glass as a memorial to the late Bishop Monk, the scaffolding was broken, while a stone mullion of about 2¼ cwt. was on it, and two men fell to the ground, one of whom was killed, and the other narrowly escaped with his life, but was seriously injured.

ROYAL ACADEMY.*

IN the middle room there are several interesting pictures in addition to those we have already mentioned. Faed's "Sunday in the Backwoods" (310), will have plenty of admirers, though it looks little like the truth, and its prettiness suffers from the power of its neighbour, "Spring." We prefer Mr. Faed's smaller work, "My ain Fireside" (595), where the male model, painted in 310, has also done duty. Rankley's "Evening Song" (368), with a brave sky, is injured by the geese. Mr. Rossiter is equal to better things than "Brighton and Back for 3s. 6d." (378). 420, "The Interior of the Church of St. Mark," Venice, by David Roberts, is by far the better of the two pictures this excellent landscape-painter exhibits. We may not now look for the careful finish which distinguishes his earlier works, but for effect and suggestiveness this picture demands high praise. 427, "Dogberry's Charge to the Watch," by H. J. Mark (Dogberry apparently studied from Mr. Robson), is full of character, and should not be passed over. 429, by Dobson, from the 2nd book of Samuel, "David bade them teach the Children of Judah the Use of the Bow," and which may be taken to typify the gentlemen who are anxiously striving to turn the peace-loving inhabitants of these isles into riflemen, and to induce them to "form," is a soundly-painted picture; but vastly inferior to the "Youths in the Market-place," or the "Dorcas" of Seasons gone by. The broad, big-footed youth, who is taking his lesson, fails to interest. The same painter's female head, "Der Rosenkranz" (316), pleases more. Dyce's "Contentment" (437), and Hook's "Cornish Gift" (439), are both capital pictures. We would also mention, in a milder tone, Dillon's "Evening on the Nile" (458), "Brunette," by R. Tait (466), and 468, "Man goeth forth to his work and to his labour, until the evening," by P. H. Calderon, where we see an old man cutting an inscription in the aisle of a Mediæval church.

Coming into the west room, we find G. H. Thomas again successful in the portrayal of a review of troops,—in the Champ de Mars this time (478); and W. Cave Thomas displaying a power in manipulation, and an exercise of thought, the recognition of which has been delayed by the recondite character of the subjects he usually selects. The present picture (479), "Domenico da Pescia urges Savonarola to have recourse to the fiery ordeal for a miraculous confirmation of his doctrines," would be improved by the removal of rigidity and the evidence of more wear about the upper part of the garments; (480), "The Burgesses of Calais," by H. Holiday, does not tell its story (it is *one* of the burgesses being prepared to go out with the rest, "bare-headed, bare-footed, bare-legged, and in their shirtes, with halters about their neckes"), but it is a work of considerable merit, and ought like many others to have taken the place of some of the very poor portraits on the line. There are some portraits, as we have already said, of great excellence; but there are more which have no business here at all—being utterly bad, and altogether uninteresting. The Linnells have several powerful landscapes (495, 546, 661), mannered, but admirable. Mr. Ansdell has two pictures (508), "Highland Tod-hunter," and (538) "Sheep-washing in Glen Lyon," good specimens of his style, and both badly hung. Mr. Ansdell's pictures are injured by the use of too much black. There is a want of transparency in the shadows. 525, "Marchllyn Mawr," by J. W. Oakes, conveys, very truly, the

> "Solitary pool, fringed round with rushes wild."

Miss Mutrie and Miss A. F. Mutrie, the first in (619) "Garden Flowers," and the second in (621) "Travellers' Joy," have produced the two most perfect and charming pictures of their class in the Exhibition. "Saltimbanques comptant leur Recette," by C. Schloesser (489); O'Neill's "Statute Fair;" "The German Patriot's Wife" (540), by J. E. Hodgson; 591, "Morning on the Lago Maggiore," by G. E. Hering; "Hieropolis," by H. Johnson (608); "French Peasant finding their stolen Child (634); Hannah's "Portrait of Hook" (636); Pickersgill's "Portrait of Mr. Gruneisen," the energetic secretary of the Conservative Land Society (606); "Capture of Mediterranean Pirates," by J. Danby (649), are all noticeable works. Mr. Hughes's picture, "The King's Orchard" (609), whatever may be the manipulative skill shown in it, and the excellence of portions, is little short of a caricature. We step into the miniature-room before closing these notes, to single out the "Val d'Aosta" by

* See pp. 306, 322, *ante*.

J. Brett, as a wonderful miniature of a remarkable piece of nature.

THE MANCHESTER ASSIZE COURTS' DESIGNS.

IT is impossible that we can offer through our review of the Exhibition at Manchester, of designs for the Assize Courts, any account that can do justice to the interesting and valuable matter brought together, or that we can print all those particulars even, which we were able to note down. We must omit description of many designs that well might deserve it, for their decorative character, if for no leading feature of plan distinguishing them from works already noticed. Amongst the designs which, not the best in the collection, of those in one or other version of classical and columnar architecture with the Roman element prevailing, testify to the fact that more enlightened study of examples is in vogue, combined with more accurate views of art, are the designs by Messrs. Clegg and Knowles ("Apropos"); Mr. E. Blatchley ("Repose"); Mr. Hamilton; Mr. W. Parnell ("L'Espérance"); Messrs. Hayley and Son ("Mente et Labore"); Mr. A. Trimen ("I and II"); Messrs. Starkey and Cuffley ("Spes et Fides"); Mr. E. Ashworth ("Nulli Negabimus Justitiam"); Mr. T. Holmes ("Desdichado"); Mr. B. Wilson ("Athenæ"); Mr. R. M. Phipson ("Rose of Lancaster"); and Mr. Kirkby ("Protero"). The design marked "Allegro," of the same class, shows the arrangement of two stories of windows under a colonnade, which questionable for convenience, therefore cannot be fully satisfactory in effect. Mr. E. B. Lamb's design ("Placet") is also one of the columnar class; and it has, in details, the originality to be found in other works by the same hand. Good outline and treatment especially characterize the dome which surmounts a central hall between the two courts.

Messrs. R. N. Shaw and Nesfield's design ("Veritate Gaudeo") is of Gothic character. There is less that is deserving of notice in the general design than in the drawing, and in the design of accessories, such as the fountain at the angle of the ground: the merit of these need scarcely be remarked upon to those who have seen the works of the authors in the Architectural Exhibition. Also Gothic are Mr. C. Brodrick's design ("Pacis Conciliator"), Mr. G. Aickin's ("Veritas Vincit"), Messrs. Lloyd Williams, and Underwood's ("Amor Patriæ"), Mr. S. Hewitt's ("Nec Prece nec Pretio"), and Mr. W. H. Crossland's. In all of these the Gothic has the Continental impress; and the general grouping, and the details of pointed-arched windows and prominent tower, seem too nearly reproductive of the models—the Doge's Palace at Venice and the Town-halls of Belgium and the Netherlands. Exceptions, however, may be allowed to this generalization. Mr. Brodrick's design has a larger amount of original thought than the other designs named; and the detail in Mr. Crossland's design is faulty only from its exaggeration. In Messrs. Williams and Underwood's drawings, however, much neat workmanship has been expended in making what is little better than an imitation of Mr. Scott's design for the Hamburgh Town-hall. Mr. Hewitt's design, Venetian in character, is one of those which have the entrance at the corner of the ground; and as in a design which we have already mentioned, the entrance is placed within the angle formed by the two courts. Messrs. Fripp and Pontem's design, with the motto "Art has its beginning in truth; its end in delight," is Gothic of English character, "Decorated" it might be called, in the main: it is a work of higher order than the majority of the Continental Gothic class; and it is displayed in a neatly executed set of drawings. Mr. Truefitt's design is Gothic likewise, but different still from any that we have named. It has a square tower at the angle. The windows of the hall are the leading feature of the exterior. The plan is conceived on the same principle as that in Mr. Worthington's design; so far as regards the form of the hall or promenade, and that of the courts entered each at the side; but greater area is given up to the hall; whilst the judges' lodgings are placed in a building at the east, detached, though with covered way of communication.

Mr. H. B. Garling's two designs, as fully illustrating a position which we have advanced, and as each very meritorious, would deserve particular description. One design, "Alpha," may be called Greco-Palladian; and the other, "At Spes non Fracta," is French Gothic. The plans are very different. The first design has three entrances in the Great Ducie-street front; one from a hexastyle portico at the principal floor level, and the others from the street level, in pavilion-masses at the angles. The plan in the Gothic design, is the best of the plans which have the principal public entrance at the corner, and the courts at right-angles to one another. In this case, other public entrances leading directly to the courts, being placed in the two fronts, the streams are distributed; whilst the judges' seats and retiring-rooms are, as it were, in one focus, to which the corridors of the attorneys and witnesses tend. The principal entrance leads into a corridor or promenade, 26 feet wide, which, with vestibules, reaches along each front the extent of the courts, or to a narrower transverse corridor of entrance already alluded to. Defects exist, for instance, in the distance of the clerk of the Crown's office from the sheriff's courts,—the former being at one extreme end of the building, and the latter at the other. In the view of the exterior, the courts form prominent central masses, rising one story above the general level. They are flanked by octagonal, conical-capped turrets, or projections, over the secondary entrances, and are crowned each by a curb roof, with dormers, and metalwork cresting and angle pinnacles. The general details include buttresses to the principal story and basement, pointed-arched, and cusped windows, the heads filled in with blank or perforated masonry, so as to receive square sashes. The portion of the building at the angle is treated as a separate mass or pavilion; and a projection from it, which includes the entrance-porch, is finished as a clock-tower, with octagonal pinnacles, and a lofty lucarned and metal-crested roof. In both designs the judges' lodgings are at the north. In the Greco-Palladian design, the entrance from the portico leads into a public hall, extending nearly the whole length of the front, vaulted and domed in three bays, and terminated by columns at the ends, dividing it from the corridors. It would be lined with coloured brick. The courts are entered from this hall, the judges' and juries' retiring-rooms being placed between them. The barristers', attorneys' and witnesses' rooms are reached by corridors, external to this arrangement, whence there are doorways into the courts separate from those of the public; and there is a private entrance for barristers, magistrates, and attorneys in South Hall-street. On this side a considerable area is given to the street; and a drinking-fountain, as in many other designs, is suggested at the angle of the ground. The portico, with steps as side-flights, as at the National Gallery, is the best in design of porticos on that arrangement which we can call to mind: the raking lines appear, and the steps are not concealed, as in the National Gallery, behind a mere extension of the podium; and the whole gronping of the portico with the other masses; the management of the major and minor orders, and of the plain wall surface; and the recession of the upper stories in the front, evince correctness of eye, knowledge, and taste. The pavilions at the angles, square on plan in the lower part, are each terminated by an octagonal lantern story, with a bold cornice, scotia, and roll-moulding, and a low domical roof-covering. The design, like most others, could not be satisfactorily described except by illustrative engraving.

Messrs. Travis and Mangnall's design—marked A. Z. Z. A.—contains much that is suggestive as regards heating and ventilating, lighting, and matters of equal importance, as well as in decorative detail. The general character externally, however, has been subordinated to some crotchet of the matters named, rather than arrived at on principles of grouping and composition, calling for independent attention. Thus the design exhibits six towers, grouped round an arrangement like that of nave and aisles—the one-story portions projecting considerably at the end of the building, so as to leave a recess for an ascent of steps to the principal entrance. The towers, comparatively plain below, are each terminated by an overhanging story of piers or pilasters, with the interspaces apparently open for the escape of smoke or vitiated air. These towers are not inelegant themselves: but the repetition of them is fatal to the general design. The ornamental details, Renaissance in style, are better than the leading forms of the building. In the plan, two public halls are properly disposed at parts of the building the most remote from one another; the space intervening being occupied by the courts, and rooms in connection with them; and in the external entrances and internal communications, classification has been well considered. The two judges' rooms are in the centre of the plan, with a door of communication, and one to a corridor leading to the lodgings. Galleries are provided for witnesses in waiting, and others. The arched form of ceiling has been adopted as most favourable to sound; and in addition, a structure, or ceiling at a height of 10 feet from the judges' platform, in metal and glass, is proposed—to extend over the space occupied by the judge, counsel, witnesses, and jury. The vault, or main ceiling, in each court, would be perforated in seventy large panels, to be filled with ground glass; and a cluster of gas-burners would be placed over each panel in a chamber, ventilated, and supplied with air for combustion. The lofty towers would extract vitiated air from the body of each court, and the building generally; and they would afford fresh air taken from a high level, and permit of concentration of flues in lieu of the alternative—fifty separate chimney-stacks. It is proposed within the courts, to follow the system of introducing fresh air at a high level, and extracting the vitiated air near the floor, on the supposition that only the nitrogen, called "the innocuous," and "smaller part of the breath," has the tendency to ascend, whilst the carbonic acid "has a natural determination to fall and *remain* at a low level."

Amongst works, to which, by reason of the time at our disposal in Manchester, we can now do no justice, we may mention the design by Messrs. Mills and Murgatroyd ("Be just, and fear not"), one of Greco-Italian character, shown in a careful set of drawings, including views of several portions of the interior. The twenty-eight drawings, bearing the motto, "Laus," include two designs, Italian and Gothic, to the same plan. The library and robing-room form the central group between the two chief courts. The sheriff's courts are placed up-stairs. The decorative features of both designs have been elaborately studied. And Messrs. Speakman and Charlesworth's design, "Elegi," dwells in our recollection, though not clearly enough for detailed description, as one of the very best of the Italian designs. It also was shown in a good set of drawings, which included a capital view of the middle of the hall or promenade, under the dome, with the entrances to the courts. Mr. Knightley's design ("K"), Italian, likewise should not pass unnamed. Messrs. Cawley and Radford ("Il Progettista") evidently paid great attention to their plan, and with good result; but their building, externally, was designed (with Ionic portico) on the scale of a small vestry-hall, and otherwise belongs to the pseudo-classic of former days, rather than to the better school which has happily grown up.

From the descriptions we have given, the professional reader will probably have no difficulty in separating the designs into several classes, according to the general principle adopted in the planning. Thus it is easy to notice the difference between the plans which we have engraved, where the hall is central and where there are corridors in connection, forming perhaps the sole access to the courts; those plans where the hall central, and two courts, are arranged as the figure , corridors round the courts or otherwise; those where a wide corridor, hall, or promenade, extends parallel with the front of the building, the courts and transverse corridors opening from it; those where a modification of the same principle is adopted—the form of the hall on plan (with *narrow* central corridor added,) being either that of the figure , or that of the figure , disadvantage of distance, which it was supposed there would be between the courts, being got over in some cases very ingeniously; those where the radiating principle is adopted; and those where the entrance is at the corner of the ground, and the courts are at right-angles to one another. That there is another question as to three distinct entrances in the one front, in connection with the wide corridor or promenade, relatively to advantage of one entrance of ample dimensions, and a central hall, has been perceived. But the settlement of the questions of general principle would leave many of the points affecting the value of plans unsettled; for, it is generally an error to assume, as some competitors seem to do readily, that re-arrangement of offices and rooms can be made "without in any way interfering with the *general* arrangement of the *plan*." Plans appear little different to one another on superficial inspection; which, through some modification of a foot or thereabouts, in corridors or halls, will be really essentially different: the relative merits, therefore, are not to be ascertained without elaborate estimate both of accommodation in the details of apartments and of total cost.

We have now brought our review of this most interesting collection of designs to a termination. We have done no full measure of justice: perhaps we have not even named designs which would

have deserved to be mentioned; and we may not have been able to apportion our notices in length in exact relation with the merits of the works that we have mentioned. We began by repudiating responsibility to remedy the errors from ignorance, and the haste of committees in matters in which as well labour and time, as experience and knowledge, are required. At double the length, we should not have got to the point of information at which the committee in this case should have arrived before venturing a judgment. Perhaps, however, we have succeeded in giving the particulars we contemplated, and in affording a body of hints for use on another occasion when assize courts have to be designed.

SIR CHRISTOPHER WREN AND ST. PAUL'S.

ON the 9th inst. Mr. E. M. Barry delivered a lecture at the Clapham Athenæum on "Wren and his Times."

Having sketched the life of Wren, he quoted some of his observations. In one of these, speaking of France, Wren says, with no great gallantry:—

"'The women, as they make here the language and fashions, and meddle with politics and philosophy, so they sway also in architecture: works of filigree and little knacks are in great vogue, but building ought certainly to have the attribute of eternal, and therefore be the only thing incapable of new fashions.' I am not sure that if Wren could now walk through the streets of London, he would consider the foregoing remarks applicable to Paris alone. Certainly he would find that new fashions had arisen, and that many of his dicta would be boldly questioned. We have but lately heard it contended that as all our present buildings (including Wren's) are more or less failures, a new style must be brought to bear, and a reform made in our architecture of the future. However this may be, it is to be hoped that, while there is no disposition to resist reform because it is change, we shall hesitate to rush upon change on the chance of its ultimately proving to be reform. The greatest architectural difficulty of the present day is probably the right use of colour in materials, and otherwise. We have been so long accustomed to the dreary reign of churchwardens' drab, that we are perhaps disposed to be prejudiced on this subject, and I should therefore be most unwilling to deprecate the right employment of so delightful an aid to architecture as colour properly employed. A glance, however, at some recent examples must, I think, convince us that on this subject we have yet much to learn, and that the utmost judgment and caution are needed to achieve success. If, however, any real advance in art can be shown to be insured by this or other means, let us not hesitate to embrace them; but I think we should demand first to be perfectly satisfied that we are in the right path, and should ponder long before giving up the grand works of Inigo Jones and Sir Christopher Wren, if in exchange we are only to have some of those curious structures seemingly so fashionable at present, which, seamed with streaks and blotted with patches, cause us to speculate on the probable effect of a petrified chessboard or a harlequin in stones."

After referring to the erection of St. Paul's, Mr. Barry made some observations on the present use of the building. He said,—"However we may rejoice to see the vast cathedral open its doors to the multitude, we must, I think, feel that if the evening services are to remain as a settled institution, and not a casual excitement, permanent provision of suitable and dignified fittings should be made for their continuance. This is far from being the case at present: the means at the disposal of the authorities have been, as I have said, very limited, and the arrangements for divine service are little better than those commonly seen at a travelling circus, and are almost a disgrace to the cathedral. Moreover, the choir is entirely cut off by the screen, with the organ upon it, and thus the mere incomplete evening service appears to monopolize the building. I cannot but think that our cathedrals ought to throw open their portals to all comers, and would therefore gladly see arrangements made for rendering them permanently available for large congregations to attend all, and not one only of the services of the church. At St. Paul's there would seem to be little difficulty in attaining this object. The dome might, as at present, shelter the main body of the congregation; the screen which now cuts off the choir, might be removed, and the choir made to serve as a suitable and dignified chancel. If the altar should be found to be placed too far east for convenience, it might be brought nearer the dome, and placed under a canopy, or against a screen, and the space behind it used as a chapel for daily service. The stall and seats for the singers might be arranged lengthwise in the choir, and the pulpit placed in a commanding position under the dome. I offer these suggestions with much diffidence, but I cannot help feeling that though it is most desirable to fill our cathedrals, it is far from desirable that the congregation should be led, by the ritual arrangements, to forget that the place in which they are assembled, is still a cathedral. And I may also be allowed to express my belief, that if the authorities would put forth a careful and well-considered plan for carrying out some such arrangement as I have hastily sketched out, there would then be no want of funds to effect their object."

The lecture was illustrated by several diagrams of St. Paul's Cathedral, and Wren's design for laying out the streets of London after the fire. After the lecture, which was very numerously attended, Mr. P'Anson, who was in the chair, made some apposite remarks, in the course of which he adverted to the difficulties which there had always been in realizing such a conception as that of Wren, most desirable, though it still was, to amend evils adverted to by other speakers, but observed that London really was not inferior to the majority of foreign cities—of which he mentioned Genoa, with narrow lanes, but magnificent buildings, as an example.

GOOD COOKERY A SOCIAL WANT.

THE waste caused by bad cooking amongst not only the labouring classes of the population, but also those of a better condition, is enormous. In thousands of instances no attempt is made to prepare variety of food, and yet we have high medical authority for the fact, that if attention were paid to this the doctor would be less needed than is the case at present. In thousands of instances in the metropolis the Sunday dinner consists of a baked joint, and this is in a great measure necessary in consequence of the improper construction of the fire-places of the dwelling-rooms for the purpose of cooking. Notwithstanding, with a greater amount of knowledge in this respect, much might be done that is not thought of at present; and the same amount of animal food might be made to go twice as far by skilful management. We are, therefore, glad to learn that a school of cookery has been established at No. 90, Albany-street, Regent's-park, under the patronage of the Countess of Ripon, Lady Colebrooke, Mrs. Archibald Tait (the wife of the Bishop of London), Lady Laura Palmer, Lady Bridges, Mrs. C. M. Lushington, and others. To this establishment, ladies becoming subscribers may send their cooks for lessons. Cooking for the sick is particularly attended to. No doubt, in an institution such as this, where a number of females can be taught not only the art of cookery, but also needlework and habits of order, neatness, and cleanliness, great good will result; and we trust that this institution will be appreciated by the class it is intended to benefit, and by its success lead to the formation of similar schools elsewhere.

WASTE LANDS: CONVICT LABOUR.

As enlightened Europe is about to prove the gigantic progress of recent civilization, by afflicting the advance guard of her sons of the Old World with all the antiquated horrors of war, I trouble you with a few lines on *Convict Labour*, and a use to which it *might* be directed in helping to diminish the risk of famine in Great Britain.

Who that has had the opportunity, has not noticed the listless and indolent manner in which felons almost invariably move in the Government dockyards? And who can be surprised at their morbid want of interest and energy on behalf of their country, as manifested in strenuous exertion, to oppose the accomplishment of an object which secures them no advantage? Now books inform us that England contains no less than 5,397 square miles of wastes *capable* of improvement, and 5,089 square miles of such as are reported to be in this respect inevitably worthless; and both these assertions may be true, when viewed by the light of economical practical speculation, for no landholder in his senses would undertake to reclaim any large quantity. But can you believe in the ultimate unprofitableness of the greater proportion of this immense aggregate of fallow and barren ground? Allow that excess of some particular ingredient mars, for agricultural purposes, *one* district by the preponderance of cold clay,—*others* by that of loose gravel, arid sand, compact chalk, or hard rock,—will not a due combination of these minerals produce a rich fertile soil?—and cannot the excess of this region be exchanged for that of another, so that the wants of each to a sufficient depth may be supplied, and the desert be sublimated into a fruitful field, yielding desert to the deserving? Judiciously drain the subsoil, then transfer some of the surplus sand of a selected locality, to mix with the heavy argillaceous surface of another, and *vice versâ*, and incorporating with each compost, broken chalk or calcined rock, and, as soon as practicable, manure, either liquid or condensed, from *city sewers*, and not imported from the neighbourhood of our antipodes.

With a proper code of regulations, and efficient, yet not inconvenient and excessively costly military control, the expensive, but, as far as manual labour is now concerned, useless, if not, by the example presented to the paid artizan, of permitted laziness, positively deleterious criminals, might in many cases be reclaimed; and whether *numbers* were so or not, each might be made to perform valuable and lasting service to his species while obtaining the capacity to appreciate his legitimate rights and opportunity to enjoy without abusing his liberty.

Explain to every individual of a certain gang of malefactors, that after a fair trial of his desire to reform, as exemplified by the industry displayed in removing, crushing, mixing, &c. the various earths, and bringing a specified extent of ground into cultivation, he should at once have the ban upon him reduced, in so far as to give him, under surveillance for a definite time, the range of the convict district, with liberty to dispose of the vegetable growth off his temporary estate till the term of his probation should be accomplished, when the freehold plot should be fully resigned to one who had so long exhibited the wish to become a better subject, and to approach the distinction conferred upon such a one in the recognition of his title to the designation of civilian.

Some *real* inducement to forsake the path of evil would thus be offered to his consideration; and what private enterprise will not venture to attempt, might gradually, but surely, be achieved, with little, if any, augmentation of the public expense.

By employing criminals somewhat in the manner indicated above, might we not, in some degree, assist to render, for the necessaries of life, "The land of the brave and the free" less *dependent* upon lukewarm friends and open enemies?

L. BIDEN.

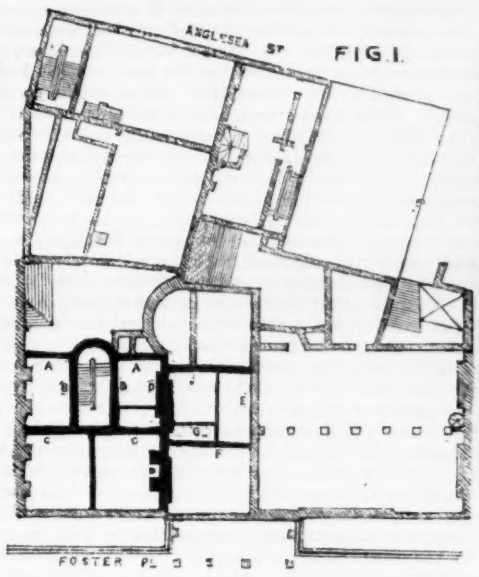
OUR WORKHOUSES.

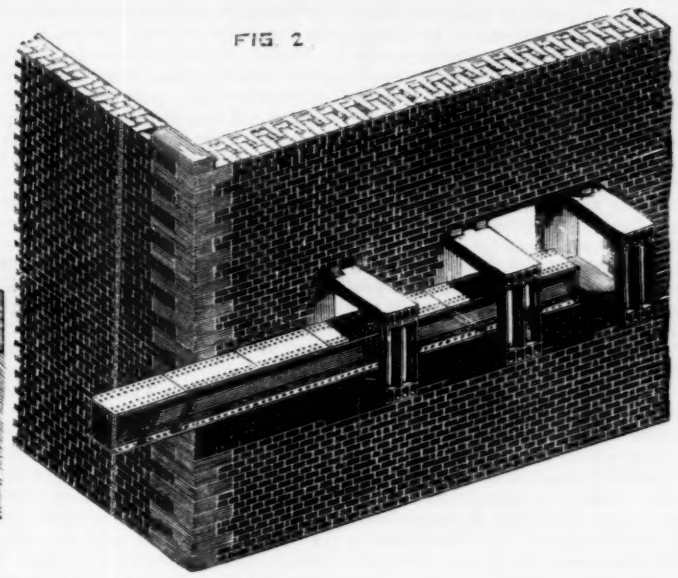
THE terrible revelations made by the mayor of Cork, respecting the treatment of paupers in that city, gives an idea of the loss which is caused by the insufficiency of food, and other bad arrangements. A shameful destruction of human life has taken place: an immense per-centage of young children have died; and in those who have passed through the struggle of early days few were left unattacked by scrofula and other diseases caused by neglect. Under the training here, scarcely any of those unfortunates will be able to fill a useful position in life, but must in the end become paupers, and increase pauperism. If the children were properly brought up, instead of being a constant source of expense, they would add to the industry and wealth of the country.

We have before remarked upon the bleached countenances and vacant expression of the faces of the young inmates of the metropolitan workhouses, and suggested that it would be profitable to improve the diet and manner of treatment.

In the report of the Commissioners of Lunacy to the Lord Chancellor, notice is taken of the great increase of lunatics in workhouses, the number having risen from 6,800 to 7,666, between January, 1857, and July, 1858. This report states that the treatment in workhouses is so reprehensible as to exceed belief,—not ours.

The rules in force to check disorderly conduct in common paupers are most improperly extended to the insane, who are in effect prisoners in those "bastilles" for life, incapable of asserting their rights, yet amenable to as much punishment as if they were quite sane. Of the metropolitan workhouses, the majority are of great size, old, badly-constructed, and situated in the midst of dense populations. The same statement applies to the houses in large provincial towns. The deficiency of the means of accommodation and exercise for lunatics is a source of infinite evil. These facts demand careful consideration. By the ill-management of our paupers we are adding to one of our greatest social evils.





A NEW MODE OF SHORING.

A NEW MODE OF SHORING.

INSTITUTION OF CIVIL ENGINEERS OF IRELAND.

AT a meeting of this institution, held recently, Mr. W. Anderson read a paper "On a New Method of Shoring adopted in removing the two lower Stories of the Royal Bank, Dublin."

After describing the position of the Royal Bank, the object of the alterations, and the reasons for which Mr. Charles Geoghegan was appointed architect, the paper continued as follows:—There were some misgivings as to the wisdom of attempting to remove the lower portion of eight walls, to do which it would be necessary to support upwards of 200 tons at an elevation of 40 feet above the basement story, and the author believes Mr. Geoghegan himself would have been slow to propose it had not a novel and safe means presented itself to his mind.

Exclusive of the danger and unsightliness of settlements almost sure to result if it were attempted to support masses so rigid and friable as brick walls on elastic pillars of wood 40 feet long, there was the objection, that to get the shores put up the whole of the ground and first floors would have to be removed, and the walls thereby deprived of valuable lateral support, when they were likely to be unduly strained by unavoidably unequal shoring. The expense, also, of providing suitable foundations for the shores, increased by the difficulty of getting such long and heavy timber into its place, would have been very great. As three of the main beams (A, C, D, Fig. 1)* were to be on the same level, rigidly connected by means of bolts and rivets, it was very desirable, for facility of manipulation, to have them all loose in the walls at the same time. Had the system of timber shores been adopted, to attempt this would have been very hazardous, if not impossible, as the multitude of supports would have rendered the lifting and placing of the beams very intricate. To overcome these objections, Mr. Geoghegan determined to make the lower portion of the walls, which he ultimately wished to remove, serve as temporary pillars to support the upper parts he wished to retain, by interposing frames of iron or wood, through which the beams could be passed. He accordingly explained his views to the author, and intrusted him with the construction of the shoring frame, which it is thought is a new feature in the art of building. Exclusive of bolts, the frame is composed of four pieces, viz. the top and bottom, which act the part of short beams, and the two sides intended to carry the load as pillars. These may be of variable dimensions, to suit the depth of beam and thickness of walls or load to be supported: they are fitted together to make a truly rectangular frame, and held in position by means of bolts. The top and bottom are made cellular, with the outer walls thinner than the inner ones, in order to approximate, as much as possible, to the form of greatest strength, which would be a series of beams laid side by side : " T " T " T " : The vertical pieces are composed of plates, stiffened by deep ribs, to obtain rigidity with lightness, and are provided with holes near the bottom, through which a rod may be passed to carry a metal roller for the beams to run on when being pushed into its place. As the frames had to be put up in inconvenient places, it was a great object to keep the several parts as light as possible in order that three or four men might move them with ease without having recourse to tackle. There are two principal conditions under which beams may require to be placed under walls:—

1st. There may be room enough to admit the beam being launched into its place, end on.

2nd. The wall may be so situated that the beam can only be put in sideways; or there may be a combination of the two cases, when there may be room to launch the beam half way, provided the previous half can be got in sideways. The one case requires a different form of frame from the other, as will now be explained. Beam D (fig. 1), supporting two heavy chimney-stacks, is an illustration of the first case. There being plenty of room in the court-yard to lift the beam to its proper level, clear of all the houses, the following preparations were made:—Two holes were broken through each of the two chimney-stacks; and a good bed having been formed in each at the proper level, four frames were placed in them, and one smaller one was similarly introduced into the intermediate walls. When all the frames had been carefully arranged in line, folding wedges of good dry oak were driven between the tops of the frame and the superincumbent walls, till the weight of the latter was made to rest entirely upon the frames. The portion of the wall and chimney-stacks between the frames was then removed; and the beam, having been hoisted on tall shearlegs in the court-yard to the proper level, was launched safely into its place through the frames.

Beam A (fig. 1), supporting the back wall, affords an example of the second case. The quoin of the adjoining house would not allow the beam to be hoisted sufficiently far back to pass it through frames similar to those used with beam D: it was, therefore, hoisted diagonally alongside the wall till its end entered a doorway in the bow projection, which allowed it to go far enough forward to clear the quoin, when raised to a level and placed at the proper height parallel to its permanent position, and in which it was temporarily secured. Two frames (fig. 2), made to project its own width on one side of the wall, were inserted into holes which had previously been cut in the brickwork, and bolted together so as to include the beam within themselves. The weight of the walls was transferred to the frames, and the masonry between them cut away as before, and the beam moved in, first sideways, till fairly under the wall, and then launched forward through two more frames into its permanent position.

Beam C (Fig. 1), was got into the house with great difficulty on account of its length, was laid on the first floor alongside the wall it was intended to support, and raised thence to its proper height, where it was temporarily held, while four frames were put round it and secured in the walls as already described: the intermediate masonry having been cut away, the beam was moved sideways into its place under the wall. At this stage of the proceedings the three main walls, being completely cut through, were supported only on thirteen frames, in which the beams were lying loose: the latter were carefully fitted to each other, and firmly secured by means of bolts and rivets, after which the whole mass of wrought iron—weighing 13¼ tons—was adjusted to its exact position vertically and horizontally. Chases were now cut in the lower walls to admit the columns, which having been carefully erected, the weight of the walls on the frames was transferred to the beams by driving folding wedges between the top pieces of the former and the upper flange of the latter, to cause the beams to deflect to their full extent previous to underpinning between the frames in brick and cement. When all was ready, the wedges over the frames were cautiously slackened, and the entire weight of the building allowed to come upon the beams and columns. The frames were retained in position for a few days, during which the behaviour of the columns and foundations was carefully watched; and as no signs of yielding were detected, the frames were released, the bolts connecting their several parts were withdrawn, they themselves removed in pieces, and the gaps occupied by their upper portions made good in brick and cement. The actual cost of successfully shoring up the eight walls in the manner described was 62*l*. The builder's estimates for the same operation, without any allowance for the great risk run, was from 168*l*. to 180*l*.—being a saving of at least 106*l*. in favour of frame system, not counting the gain in time, security, and convenience. The urgent necessity of completing the work as quickly as possible, induced the builder to use more frames than were absolutely necessary: had there been no occasion to shore so many walls simultaneously, the work could have been done for 42*l*. or one-fourth the lowest estimate quoted above.

A detailed account was given of the weight, strength, deflection under test, and cost of erection of the wrought iron beams used. The columns which were of the unusual length of 26 feet, and only 12 inches diameter, were minutely described, especially as regarded the precautions adopted to ensure a uniform thickness of metal. The whole of the iron work had been designed by the author, and executed by Messrs. Courtney, Stephens, and Co. of Dublin, before leaving whose works the beams were all tested, in presence of the architect or one of his assistants. The liberality of the directors was applauded for encouraging their architect to carry out a new system of shoring, which has turned out so much to the public advantage; and great praise was given to Messrs. Crowe and Sons, the contractors for the work, to whose zeal and intelligence the success of the operations was in a great measure due. In a discussion which ensued, members expressed their satisfaction in the simplicity and usefulness of Mr. Geoghegan's invention.

* We have been spared the necessity of re-engraving the diagrams by the obliging courtesy of the editor of the *Engineer*.

FREAKS AND ODDITIES IN BUILDINGS.

THE works of man will ever bear some mark of the weakness and the corruption of his nature. Among his productions is architecture, an art which is ranked among the fine arts, but which belongs most essentially to the exact sciences, because it is subordinate to geometric rules and calculations. It is one of the most ancient and one of the most sublime of the arts. Like other beautiful things its fate has been much abused. It has been a means of developing the conceptions, the skill, and the energy of some of the most eminent men; but, on the other hand, at revolutionary periods, when the taste of a nation has been completely vitiated, and when to the love of the impure and the distorted has been added the love of the glaring and the gaudy, the useful and the ennobling influence of architecture has been dead, the appreciative powers of the human mind have been diverted from their natural bias. The qualifications required of the architect for excelling in that which is so beautiful as an art, and so difficult as a science, are very numerous, and require a long life of labour to attain them; but they make the profession valuable to himself, to Government, and to his country, or the land in which he sojourns. They teach him the necessity of arriving at a high degree of perfection in many things; the necessity of beginning and continuing his career under a high standard of virtue and of merit; of considering it a misery and a privation to be by any cause carried away from the object of his ambition, or some beautiful design that is absorbing his faculties, and for which he is struggling to attain a great prize, or an order for its execution. He will also be cautious of receiving that praise which often raises us in presumption to an undue height above our real selves, in persuading us that we are already above others; and keeps us in a vicious mediocrity, which prevents us from arriving at perfection. Perhaps the number of faults that an architect has to avoid are greater than that of the qualities which are necessary to him. But for this reason the possession of the latter are essential to keep clear of falling into the former. The best buildings in the world are not without faults: they show, however excellent, that those who designed and reared them, are but men; and though the solidity of their constructions, their fitness to the ends for which they were planned and designed, although the loveliness and agreeableness with which they are embellished, are irreproachable; yet their beauties do not excuse the omissions or the neglect of certain parts, as equal attention should be given to each part as well as to the whole. They only palliate them. We throw a veil over the small imperfections that mar a little, but which cannot efface superior excellence and higher qualities. Such buildings are praised and imitated in spite of them. They become the type on which others are modelled: it is idle to prove they are faults when we are struck with their general beauty; for some may be very dull, and make no impression in their favour, no sentiment or sensation of pleasure, and yet be unerringly correct. Beauty sometimes appears where even order is transgressed, and is wanting in works perfectly regular. But a certain negli-

gence is one of the things that pertain to genius: it may be its weakness, but it is one of the ornaments of style, one of its modes of producing effects which seem the results of enchantment. Marmontel says, that the three distinctive qualities of beauty are force, riches, and intelligence. What has tended so much to the perversion of taste in architecture, and, consequently, the withdrawing of its influence upon the public mind, has been the folly and assumption of architects and artists substituting themselves to the public, deciding in its place and in its name, and reasoning, as if with the power of oracles and tribunals, upon the impressions that the mind of another ought to experience. The obstacle that this presented to the improvement and progress of art and the increased interest taken in everything concerning it, was happily overcome by the invention of printing,—that boon to modern times, which, perpetuated ideas of the past, the present, and the future, which scattered knowledge, and which condensed it, which made people educate themselves, which led to the formation of libraries, which popularised thought, and multiplied the means of instruction. Public criticism may be often a lever to the art, a bridle upon its departures, a lamp to light the inquiring student; but the most enlightened criticism does not exist, and never existed till a long time after good works have been produced, upon which there can be no doubt as to the estimation in which their qualities should be valued, and which, after all, guide, instruct, and inform it. It is known that it sometimes evinces no gratitude or recognition of the works to which she is indebted, and from which she has borrowed. Criticism has always been imperfect, and would remain so until some great geniuses, or a great school of art, have shown something on which it can form and assimilate its mind and its judgment to works of art, and on what they depend for the effects they produce. Such men, themselves admirable critics, and such a school allowed to be authorities and masters, are the reformers of their age: they have only the time to imagine and to create what are the materials of taste for the judgment to exercise itself upon; and critics, out of the field and theatre of art, perhaps at first feel astonishment at the new creations which make such a sensation in the world, and with difficulty know how to admire them when they do not envy them, and certainly when they cannot rival them.

The writer of this article will yield to no one in his admiration for the real beauties and perfections of architecture, of faultless building, although it is now his intention to dwell chiefly on examples that have principally come under his observation of edifices and constructions on quite the reverse of good principles, and diametrically opposed to all the laws, the prescriptions, the maxims, and the rules of taste and of common sense.

First, of columns — those noble and useful features of architecture—those strong but simple objects which make its sublimity. The ancient and modern poets, in their episodes, omit not to describe in their lofty rhyme the grand effect of the columnar structures and their sumptuous decoration, within and without the palaces, on some lofty eminence, of the brave of the heroic age, or the proud and valiant knights of the baronial age. And whoever has beheld in the seas vast petrifactions rising from its waters, formed by the hand of nature into a series of gigantic columns, grouped together with a firmness which no force can sunder, and watched the surging waves in majestic but terrible forms around its immovable base,—has been awed by the idea of the sublimity that such a pile in such a situation conveyed: not unsimilar, though in a much less degree, is the effect that is produced on the mind and on the heart by the contemplation of a vast number of beautiful columns, in symmetrical order, in a building raised by human hands, and imposing by them, and by the masses that it admits in its combinations. Look at the temples of the ancient Greeks, with the long, luminous, and shadowy perspective of their peristyles: look at those leading ornaments, with their nicely-measured lines and graceful flow of curves wrought into such eleganee by them out of the glowing marble of Pentelicus: look at them, singly or coupled, encircling with their rich zone the base of elevated domes, and serving as buttresses to these domes. The dome of St. Peter's, or St. Paul's, or that of the church of St. Génevieve, or of the Invalides,—look at these, and it is only to admit that architecture owes much to the right and just use of these noble ornaments. It is the wise combination of lines artistically composed, and placed so as effectually to support a superincumbent mass; it is the graduated swell or diminution of the shaft of this member; it is the proportion and the execution which the enlightened pupils of an Ictinus, a Phidias, or a Callimachus have given to it which constitutes its beauty and its claim to our admiration. The temple which they girthed and fortified was as a shrine of simplicity. See the small circular temple of Vesta at Rome, once surrounded with columns, or that of the Sibyl on a rock, at Tivoli.* How beautiful they must have been in the days the priests offered sacrifice there!—the spot near to which Horace had his farm — the valley and the country which are a paradise for poets and artists! The few examples cited, out of love for the columns that adorn them, are works of architecture that defy censure, and put criticism to silence. Yet, notwithstanding this, and that the column wants no commendation, and that to alter any part thereof which concurs to its perfection is a kind of desecration; its employment in different edifices has been sadly abused by modern architects, and to such a degree and such an extent that the spoilers might be supposed to have taken a malignant pleasure in depriving it of its superlative qualities—those qualities which, in despair, they must only copy or modify with the greatest caution and scruple. It has been despoiled of its fair proportions. Of course the ancient depended upon the column, and the office assigned to every other part for exercising upon the souls of observers that influence and that emotion which were irresistible when regarded in relation to the entire whole. The secret or the cause of the exact strength, and of its striking beauty, of the surface even which the rays of a brilliant sun magically illumined; the harmonious arrangement of the moulding and of its base, and the expression of its capital; all these have been taken away to gratify individual tastes and idiosyncrasies. It has been distorted in the hands of men who were only artists of discord, of whom it was not worthy: it has been used for secondary and for other purposes than those for which it was intended, and a great deal of art has been thrown into chaos and confusion in consequence. In architecture, as in morals, honesty is the best policy. If, as the poet Pope says,

"An honest man's the noblest work of God,"

a man should make his work possess that same noble quality to which his nature ought to aspire. It is futile in art to try to surpass a work of matchless genius. It is only to ape, to imitate servilely, or to caricature it. Perhaps the French architects are addicted as much as those of any other nation to the *hors-de-propos* treatment of the columns in their buildings. Owing to this the beautiful architecture of some of their public buildings or *hôtels* suffers. They are in the habit of intersecting and banding them by flat horizontal stones or vermiculated stones, at certain distances, or rusticating them, as if to break the monotony of their height, or as if what was strong enough might still be made stronger; but the true expression and signification of this member, which is beautiful and perfect because it is just and founded in truth, is thereby entirely destroyed. The ancients knew, and existing ruins prove, that after nice calculations they were fully able to perform the office assigned to them, without any such addition, and especially such a one as is no improvement. The French are likewise accustomed to cable or fill up, about five feet high, from the top of the base of the column, its elegant flutes—elegant as the well-arranged or natural folds of drapery on a statue. Can any one divine their reason for doing this? Is it to gratify the avidity of the public for novelties? Is it to satisfy the love of contrasts? Is it to astonish them by extraordinary combinations? Is it to make some illusion by the assistance of decorations? or is it done for producing in a given space a little more light and shade? We think that if the party or parties in question were asked the intention and the motive of it, they would be at a loss to explain, or their pretext would be very fallacious. What is done certainly destroys the original effect, and shows that the true sublimity cannot be reached without simplicity. There should not only be in buildings a good reason for everything, but the grounds of it should be evident, and require no interpreter. We do not contemplate buildings with the expectation of having to solve problems. The public is satisfied only with successful results: it does not trouble itself either about intentions or the difficulties the architect has had to overcome. An architect, whose practice consisted more in the breach than in the observance of rules and precedents, once put before the entrance-door of a house in London a quarter-circle portico, with only one solitary column supporting the entablature, with tiny consoles at the two ends, abutting against the wall in lieu of pilasters. One column only conveyed the idea of weakness; and weakness of whatever nature, excites pity, and is always dangerous and treacherous. It is lamentable when common sense and ordinary observation are able to detect the vices and the falsifications in a building, and discover its frauds;—we say lamentable, because it is a proof that there is empiricism in every trade and profession, not by any means excluding architecture; and that the public are judges, and sometimes as good judges as artists themselves. They see an attempt, but not a deed: they see owing to neglect, to indifference, to *scamping*, to omission, or false economy and mean spirit, a failure, where a little more outlay, a little more consideration, a little more love and labour well bestowed on the work crude and unfinished, would have supplied the deficiency, and actuated the individual by better motives. It is as bad as "spoiling the ship for a ha'p'orth of tar." Chambray says, with truth: "The order Caryatides first produced in a period of decline of art, and first, perhaps, introduced upon the degeneration of the Ionic order, in which women are represented, where delicacy does not correspond to the weight of the burthen with which they are charged, gave rise to all extravagances." Any ornaments from the ridiculous ideas and associations they give rise to, and from their want of just and appropriate position, become *signs* of a weak mind, of passions predominating over reason, and of a degraded taste.

Whatever is not justified, whatever cannot be accounted for, and whatever is not in the nature of things, or does not serve a useful end, is not beautiful. The dome and its basement, at the Institute in Paris, are too large, and out of all proportion to the portico and rest of the building beneath; and on the roof of this old building are false chimneys, intended for ornaments, called "cassolettes," out of which no smoke is ever seen to come, but some flames in stone are substituted for the real. The small and mean towers on the top of our National Gallery, the work of Wilkins, of Cambridge, have been called "pepper-boxes," a nickname which your readers will agree is a deserved stigma, and no detraction from the character of that uninteresting edifice. In many ancient churches and cathedrals, the wood-carvings of the stalls of the choir are not all of them choice in their subjects; but it is well known that in the Middle Ages, and in superstitious times, the sculptors and stone-carvers represented good and evil spirits, demons and angels, personifications of good and evil; that they ridiculed the priests, who might have been patterns of morality and virtue, and yet were discovered once or twice erring; that they caricatured some odd characters in their own craft. To the antiquary and to the historian they supply materials as to manners, costume, instruments used, and even from these in some respects objectionable carvings, we may learn something, and find that "there is some soul of goodness in things evil." They are generally out of sight, beneath the seats of the choristers, and are shown by the sacristan only to the curious eye of any one requesting to see them. There are some very remarkable ones in England's cathedrals, and particularly in Rheims cathedral. Victor Calliat says that "the stalls in the cathedral of Poictiers are the most ancient known in France: they date from the first-half of the thirteenth century; and, according to the general custom in great churches, they are disposed upon two floors—an upper and lower. Their ornament is simple and severe, contrasted with that of the greater part of the stalls of the end of the Gothic period, which ordinarily present a prodigious profusion and richness, joined to the most admirable skill."* We have remarked, in some of the churches of London, and in some village churches, escutcheons and heraldic badges, and inscriptions on monuments of exaggerated or equivocal praise, which reflect more the vanity of the living than the virtues of the dead. Simple and unostentatious with a brief epitaph, as—"Peace to his ashes,"—should be the trophy raised to the memory of the dead. In St. Martin's Church,

* Soufflot, the architect of the church of St. Génevieve, Paris, was the first architect known who gave to the world details and measures of the round temple at Tivoli, and that at Pœstum. They were most carefully measured and drawn by him. Dumont, architect to the king in 1764, and Soufflot, were to the French what Revett and the Athenian Stuart were to the English. Dumont constructed the theatre of St. Carlo at Naples, theatres at Rome, Turin, Milan, Paris, and other cities, and published all of these in a folio under the title of "Recueil de plusieurs Parties d'Architecture de different Maitres."

* "Encyclopédie de l'Architecture." Paris.

by Gibbs, you see what is too glaring and what is out of its place because it is a civic emblem, the national arms glittering in burnished glory over the arch at the east end: you see what the child is taught to say, "the lion and the unicorn fighting for the crown." Now this would be very well in a hall of justice in the Mansion House or in Guildhall, but it is out of place here: it would be much better to have placed, or to replace now the unfit object with, a glory, a cross, or the head of our Saviour. It is lamentable to see the best and the most beautiful things going to ruin and changed into very different purposes from those which were witnessed in their palmy days; to see an Eltham Hall, Kent, now a barn or a granary. Many more instances might be adduced. The French have, perhaps, done more than any other nation to restore their ancient edifices —those rich legacies and heir-looms of art; and one single man (Lenoir) stands out amongst them prominent for his labours in this.* His countrymen and posterity will owe him eternal obligations for preserving so many historical monuments which, in periods of revolutions, would, but for such exertions, have been buried, mutilated, or entirely destroyed. As there often is a striking intermixture of beauties and defects in the same edifice, it is almost unavoidable the writer giving to this article a similar medley. He finds his ideas waving to and fro,

"From grave to gay, from lively to severe."—*Pope.*

Next, all buildings, public or private, should be fire-proof. It is a great folly to build any sort of habitation without fire-escapes, a rope-ladder rolled up, or one like that used by the firemen to-day, let down from the windows to the street: easy modes of exit in the ceiling or in the roof to the lead or slates should be provided in the event of fire. It is shocking where self-preservation has not even been cared for or studied in a dwelling. An invalid unable to bear the least noise outside his house, or with weak vision, and requiring a dim or borrowed light within, but objecting to revolving shutters or double windows, might have the exits he complains of obviated by the plan of his domicile consisting of a square within a square built of unequal proportion; the outer walls and inner partitions panelled, forming between them a passage of 4 feet width all round, the latter with glass deriving light for the rooms from the external windows; and both supporting the floor above. This design would not exclude the indulgence of architectural beauty: on the contrary, it would offer an opportunity for showing some of its happiest interior effects. Arches might at certain distances be turned from pilasters, and in their intervals niches for candelabra, models of celebrated columns, busts, and statuettes. From the centre-flower of each arch there might be suspended flower-baskets, bird-cages, or Chinese talc lanterns. On the walls at the end of the passages might be mirrors or an artificial grotto and cascade or fountain. The means adopted for such an object, and the comfort and convenience attained by it, would be a sufficient vindication of its unusual kind of construction. I am aware of the powers of the Building Act, and that though formerly it was much the custom for every householder and proprietor to be his own architect, times are changed, men are wiser, and regulations are enforced. Once the excessive height of buildings in narrow streets was not less prejudicial to the salubrity of the air, in close and peopled cities, than it was contrary to the security of the inhabitants, especially in case of fire. It is now necessary to observe a given proportion, prescribed by Government, between the width of streets and the height of houses. Notwithstanding these building laws, there are certain independent proprietors, high and low in their tastes and sentiments, doing, unrestrained, all sorts of things, and indulging their own fancies and caprices; doing what they like with their own; and even an accomplished architect, Sir J. Soane himself, annoyed his neighbours by projecting the front of his house in advance of the other houses, and in order to enlarge his private museum. We see the natural or the acquired singularity of a propensity or a will in every thing to which man puts his hands. A Jack Ketch having resigned his office as executioner from a fortune he had made by betting on the turf, left England, and built a house on some land which he bought in a foreign country. The sole ornaments which he selected for decorating it, were mouldings of rope sculptured round the doors and windows, and round his fire-place. These recalled his past life, and the memory of the fatal instrument by which he had finished the lives of the condemned. We have noticed the natural partiality that sailors and fishermen have for scattering or grouping curious forms, consisting of rock, shells, and sea plants. The origin of the names of streets is rather curious. Every trade formerly exhibited in its shop its particular sign. A house in Paris, corner of the Rue du Temple, opposite the Hôtel-de-Ville, has the sign "*A la Coquille*," and you observe sculptured in the middle of the head of each window a scallop-shell. We may easily lay these singularities of ornament to a class who boast that every man's house is his castle, and who sometimes make it like one in some degree, putting battlements, shields, helmets, banners, and trophies of war to walls which should express nothing but peace and domestic quiet. The greatest incongruities, and discords of form and colour, that were perhaps ever perpetrated, were by settlers, who have become rich in a colony from the gold-diggings, or from farming and breeding cattle; but who, though rich and proud to build for themselves, are no judges at all of what they undertake. But we have shown that faults and freaks exciting ridicule are very often committed by architects themselves, from whom we look for better things; and indeed, in public edifices erected in the centres of civilization, we are surprised that so many are marred by a mode of treatment, against which wit and satire naturally aim their shafts. Bull's-eye windows do not look well when seen in the centre of the pediment, where sometimes a clock is put, or in the centre of arched recesses, as they occur in the river front of the *Monnaie* (Mint) and Palais Royal, and other excellent buildings, in Paris and elsewhere. A square-headed window looks still worse. Bull's-eye windows look well in spires and in domes, varying the otherwise too monotonous space. In the great external dome of St. Peter's, Rome, there are remarkable ornaments at certain heights and distances; shields surmounted with scallop-shells and lion's head, at the top round a "Three days," or bull's-eye. Here it is very appropriate. The French and other nations have had a prevailing notion that they could equal or surpass the ancients, and that they are superior to them in many things, and might be so in architecture and its decorations, for whose beauty there was no limit; that they were not disposed to be casting in other men's moulds, famous as their issues were; that if they had genius, the characteristic of which is to invent, they might ignore, at least not be tied to, the rules of art; and they were ambitious of producing works whose design and execution were a creation of their own. All this is very reasonable. But the approved ancient styles and orders withstand the rigour of the severest judgment, the most trying test. Their architecture is as a liquor which cannot change its vase: its style, original and simple, cannot represent other than its own, or be altered essentially without irreparable injury to it. Among the faults and heterogeneous fancies of the moderns, criticism will yet follow with interested eye the trace of talent.

In "the good old times"(?) the wooden bridges were covered with wooden houses;—old London Bridge, for instance, and old bridges in Bristol and other ancient cities, which remained till the end of the last century. The situation of houses on bridges is very unhealthy, on account of vapours and exhalations from the water and the impurity rising thence from the change of tides. Within a few years on the Seine, near the Pont-Neuf, there was a charitable institution, called "The Good Samaritan," which was erected on piles over the river and level with the bridge. It is now pulled down, and swimming-baths and lavatories occupy its site. Thus times change, and we change with the times. To what vile purposes have some public monuments been perverted. Within the memory of many men living it was the savage custom to put the heads of traitors and conspirators on iron spikes on the top of Temple-bar. In "the good old times" thousands of persons, but principally the poor, were the victims of the plague, of fever, or the cholera, which might not have invaded the cities or those quarters had their dwellers been blessed with the sanitary improvements and measures and remedies with which the science of the nineteenth century supplies them. To prevent and cure smoky chimneys is still a problem,—a bone for builders to pick. There is evidently, in general, not enough vent and space for the smoke: the flues are not large enough, nor the stacks carried sufficiently high. If trees are planted near the house and grow above it, or if neighbouring houses are higher than it is, its chimneys are sure to smoke. It is all very well in poetizing to speak of the mud cottage in the hamlet, embosomed in trees, with its smoke on a serene morning curling above the thatch, which it may do in certain temperatures and when the air around is rarified; but let the temperature change, and downward blasts impinge on the roof, and the wind will certainly beat the smoke down the flue. Many of the deformities on roofs, in consequence of appending to the chimney-stacks pipes of the form of every letter in the alphabet, syphons and cowls of all shapes and sizes, make a very grotesque outline against the sky. What would Dr. Syntax think of them in his search for the picturesque? The old system of gardening by Le Notre has been peculiar to the French since the time of Louis XIV. and the gardens of the Tuileries, of Versailles, and others are the examples of his ideas in laying out grand walks and terraces and plantations in a vast symmetrical plan: it must be allowed they are adapted to chateaux, which are vast, and regular, and noble. They remind one of the royal and stately residences half concealed among trees,—the retreat of those pleasant groups which Watteau painted in his rural scenes. Notwithstanding we cannot resist the attraction of these spots, we must admit they are rather monotonous.

"Grove answers grove, each alley has a brother,
And half the landscape just reflects the other."

The early minstrels of France erected a church in Paris, not, we believe, now existing, but preserved in a book in which their sanctuary and singing resort was ornamented with the costumes that they wore, and all the kinds of musical instruments on which they played. The first bards received lessons from the Druids in inaccessible seminaries, built in the midst of a park, *ædificio circumdata sylva*. They there passed ten or twelve years in learning to sing, in playing the harp, and in composing poems and hymns: they were obliged besides to learn by heart a great number of verses.* Charlemagne substituted the Gregorian chant in the churches to the Ambrosian chant. Harmony was introduced into temples. The custom of part-singing was observed about the year 1022. Its excellence, which at first was turned to the profit of religion, was afterwards attended with sad results. Surprised at its means of seduction, princes blended it with their pleasures and luxuries, and music was less and less employed for the praise of the Eternal. A succession of licenses brought the art to the point at which we see it to-day. This is a great pity, for music, directed by philosophy, is one of the most beautiful and useful gifts of Heaven, one of the first aids to religion, one means of heightening the worship of the church, and one of the most excellent institutions of man.†

FREDERICK LUSH.

* In the *Musée des Petits-Augustins.*

THE TOMB OF A CELTIC CHIEFTAIN.

A VERY interesting discovery has been recently made at the very gates of Paris, viz. the tomb of a Celtic chieftain, interred more than twenty-five centuries ago, with the remains of his wife, his horse, and his armour, in the peninsula of Saint-Maur-les-Fosses. The spot is now called La Varenne-Saint-Hilaire, and other discoveries lately made there seem to reveal the existence of a Celtic city of some importance in former times.

This tomb, placed at a depth of barely 30 centimètres below the surface of the vegetable soil, which extends to a depth of more than a mètre in this place, consists of two very distinct portions, the *cromlech* or consecrated enclosure, and the *tumulus* or tomb, placed in the interior, and enclosing the two human bodies and that of the horse. The *cromlech* was formed of eighteen blocks of quartz rock, roughly dressed, of ordinary dimensions, but of different form, placed one beside the other, so as to form a circular inclosure of about 2 mètres 30 centimètres diameter; a portion of which towards the north seems to have suffered considerably from the pressure of the surrounding earth. Near this part, and in the direction of S. E. to N. W. was found the *tumulus* enclosing two skeletons, in a very tolerable state of preservation, lying on their faces, the heads being slightly turned towards the south-east. That on the left side, the body of the warrior, was placed in a very regular position, the head resting between the two hands: the jaws were furnished with nearly all the teeth, twenty-five, of a beautiful whiteness, with the enamel preserved. Near to him was found an arrow-head of bone, also a lance formed of deer's horn; part of a handle in oak, or fragment of a shaft, which by age had lost all weight, and had the appearance of cork. At the left of the

* J. B. Leclerc, *Essai sur la Propagation de la Musique en France.* Paris. An IV. of the Republic.

† To be continued.

interior of the *cromlech*, on several stones, placed no doubt for the purpose, were found the other arms of the chieftain, comprising a hatchet or tomahawk of polished flint, with a circular sharp edge, and a hole through it for a handle; an arrow or javelin head; a broken knife, which, all of white flint, had lost their transparency owing to the effects of violent heat. Some fragments of pottery were also discovered half-burnt, and presenting all the characteristics of the earthenware of the same period which has been found in many other places. At the right of the warrior, and in contact, lay the skeleton of his wife in very much the same position, but still with some slight difference as to posture. Younger than the former, she must have been consigned to the tomb after a violent death. All these indications agree exactly with the traditions handed down to the present time, with regard to the manners of the ancient Gauls; and it seems probable that the woman was immolated on her husband's body previously to joining him in the tomb. This curious monument has been presented by M. Legay, the architect who discovered it and made the excavations, to the minister of state, to be placed in the Museum des Thermes in the Hôtel Cluny.

WORKS IN PARIS.

THE activity displayed in the great works of public utility in Paris has not slackened. In all directions ancient streets are widened out, and put in proper alignements; new boulevarts break out; the restoring and embellishment of religious edifices continue; and many squares will shortly, by the verdure of the lawns and beauty of flowers, delight the inhabitants of the most populous quarters of Paris. The demolition has commenced of many houses in the Rue de la Vieille Monnaie, of which one side, now standing, will shortly "come to grief" to make room for the elegant constructions of the new Boulevart. On the left bank of the Seine, close to the Pont St. Michel, the first of the new symmetrical houses, with arcades to decorate the site, is completely terminated at the corner of the Quai des Augustins. All the massive work of the monumental fountain, which is being built into this place in the axis of the bridge, is also finished, and the ornamental part of the structure is commenced. It is to be dedicated, it is said, to St. Michael.

Workmen are now engaged in building six piers in the side-alleys of the Boulevart Mazas, three on each side, to support the skew-bridge on which the Vincennes railway will cross the boulevart.

The plans and projects for the weirs and locks to be constructed in the Upper Seine, for which a preliminary court of inquiry is open at the Hôtel de Ville of Paris, Office of Ponts and Chaussées, are the work of M. Chanoine, engineer-in-chief of that corps. The intention is to fulfil the promises of the 31st May, 1856, when a law was passed opening a credit of seven millions for the amelioration of the Seine. Four millions and a half have already been spent.

The first pavilion of the secondary buildings of the Halles Centrales extending along the Rue des Prouvaires, advances rapidly. The underground story is just finished, and gives a very good idea of the importance of cast iron in great public works. It consists of a vast series of rows of cast-iron pillars, six mètres apart, placed diagonally, which receive the girders of cast iron also, which are united by brick arches most carefully fitted together. This story communicates with the upper one, by means of stone-staircases and trap-doors, with machinery for raising or lowering merchandize. Ventilators and louvres of thick glass give necessary air and light. As in the case of the pavilions already in commercial use (except the under story), the foundations for the columns are of brick, laid on a course of brown Vosges stone. All the rest is in iron.

The interior of the *Sainte Chapelle* is completed, and is open daily to the public on application, by an order from the authorities, and to strangers on showing their passports.

The Boulevart de Sebastopol, south of the Seine, is fully opened as far as the Museum of Cluny. The Roman remains of Julian's erection are now isolated from all contiguous buildings, and a garden planted to the north. In the garden several architectural monuments are being placed: the original colossal lions, &c. from the tower of *St. Jacques la Boucherie*, are among the recent acquisitions. The arrangement of objects in the museum has been much improved.

The pretty Hôtel d'Osmond, on the Boulevart des Capucines, has been levelled to the ground. An edifice for the Jockey Club is intended to replace it.

THE NEW HOUSES OF ASSEMBLY AND GOVERNMENT OFFICES, WELLINGTON, NEW ZEALAND.

THE new building is a two-storied one, in the Pointed style, contains thirty-three rooms, and covers an area of about 9,000 feet. There are two chambers, one of which is for the Legislative Council, and the other for the House of Representatives. The ceiling of the former is divided into eight compartments by moulded ribs, intersecting in three places a moulded circle and carved pendant centre piece, from each of which will be suspended a chandelier. The Strangers' Gallery is at one end, and that for the reporters at the other. The speaker's chair is provided with a canopied screen, finishing with an ornamental finial, which springs from the clustered moulding forming the front edge of the screen.

The principal Chamber, the House of Representatives, is 50 feet long, 25 feet wide, and 24 feet high. The design is described as a mixed one, the Gothic style predominating, the whole being made up by selections from the drawings of three of the competitors for the premium offered by the Provincial Government, twelve months ago, for the best design for Provincial Government Offices and House of Assembly. Mr. Single acted as architect, Mr. Carter was the builder. The total cost of the buildings, including the purchase of two acres, and the expense of levelling the site, was about 9,000*l*. Some drawings that we have seen do not impress us with a high opinion of the art shown in the design.

AMERICAN NOTES.

IN 1854 it was proposed to build a suitable new structure at Brooklyn, New York, for a state arsenal and city armory, but for a length of time, and owing to a variety of circumstances, the project remained unaccomplished. Upon the sale of the existing state arsenal in New York city in 1856, an application was made to a committee of the legislature for 4,000 dollars towards the proposed building, and it was granted. To this sum the Brooklyn common council added 12,000 dollars; but as the fund could not be united it became necessary to erect two distinct buildings, and both have been since completed. The "State Arsenal" stands on a portion of the old Wallabout ground, on a plot 175 feet towards Portland Avenue, and extending through 200 feet to Hampden-street, and is 170 feet by 65 feet, two stories high, and with two towers, erected at diagonal corners; the ground-floor being used for the storage of heavy ordnance. The "City Armory" is 100 feet by 48 feet, at the corner of Henry and Cranberry-streets, on the site of the old Apprentices' Library, the foundation-stone of which was laid by General Lafayette, in 1825, and is placed at the second landing, is four stories high, built of brick in the Romanesque style, and has stone dressings.

Extensive buildings, with handsome marble fronts, are in progress at New York, and new streets are springing up. The building trade is particularly brisk there just now.

NOTICE OF IRISH BUILDING WORKS.

THE new Town-hall at Newbridge, county Kildare, has been opened. At the same place the first stone of buildings for gas-works has been laid. Messrs. Irwin and Holloway are the contractors.

A new church is to be built for the parish of St. James, Dublin, after designs by Mr. Welland, architect to the Ecclesiastical Commissioners for Ireland.

The new church to be erected at Rathgar, county Dublin, by the trustees of Gold's charity, will cost between 8,000*l*. and 9,000*l*. and be an important edifice in the Gothic style.

Mount Argos new buildings are to be erected under the direction of Mr. J. J. McCarthy, architect. Plans for them had been prepared at Rome, and sent to Dublin, to be carried out by a local architect; but alterations being found desirable, a change, both in the design and the intended professional supervision, took place, and the result is as above stated.

The theatre of the Mechanics' Institute at Dublin is to be remodelled, and made suitable for scenic entertainments.

New gas-works are to be erected at Dungarvon and Carrick-on-Shannon. We may observe that lighting by gas has been very generally adopted of late years in Ireland, and there are very few towns of any importance now without it. Gas has been likewise very extensively introduced into country residences; and the necessary works erected by two Dublin gas-engineering firms, Messrs. Edmundson and Co. and Mr. Daniel respectively.

COMPETITIONS.

Newcastle-under-Lyme Town Hall.—The Town Council, being desirous of restoring and making additions to their town-hall, instructed their surveyor, in January last, to advertise in the *Builder*, and other papers, for designs, offering a premium of 20*l*. for the best design. Twenty-nine architects sent in drawings for the proposed works on the 31st of March. Those of Mr. Stevens, architect, Manchester, have been adopted. A meeting of the council will decide whether Mr. Stevens's present plans shall be carried out or a new town-hall erected.

Castle Connell.—In the late competition for a new church at Castle Connell, the final decision rests between the designs of two competitors. The committee have advertised for tenders, and both plans will be submitted to the contractors who may wish to tender, and the result, we are told, will regulate the selection.

PROVINCIAL NEWS.

Cranbrook (Kent).—The vestry-hall, recently completed in this town, has been opened. The building is situated at the south side of the churchyard. The hall is to be used for parochial purposes and public meetings. The architect was Mr. Martin Bulmer; and the builders, Messrs. Evans, Brothers, of London. The cost exceeds 1,700*l*.

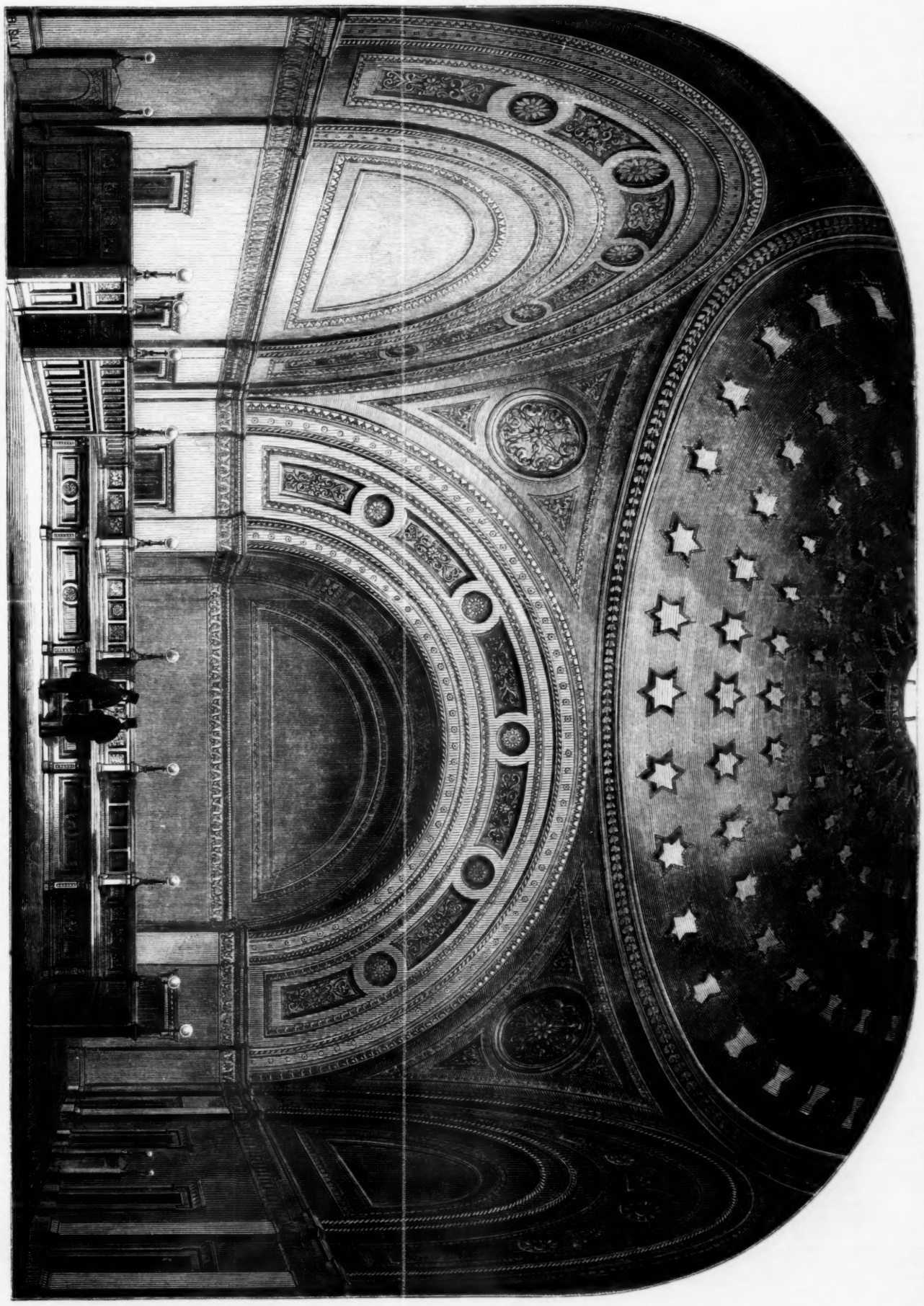
Stafford.—The iron girder-bridge, now in course of erection at Baswich, to replace the wooden one which was destroyed by fire in October last, is approaching completion. The piers on which the down line of rails rest have been completed, and the traffic along the line has been carried on over them, up and down. Two piers only for the up-line rails remain unfinished.

Shepton Mallet.—The waterworks to this town from Winsor's-hill are now let, and the works will commence as soon as arrangements can be made. One portion of excavating is taken by Mr. Oliver, a contractor on the East Somerset Railway, under Mr. Rowland Brotherhood, which works have been completed. The masonry of the reservoir is taken by Messrs. Emery, of this town.

Midsomer Norton.—The foundation-stone of a new market-house has been laid here. It is to be erected by the Midsomer Norton Market Company, under the Limited Liability Act.

THE ROYAL BANK, ST. ANDREW'S-SQUARE, EDINBURGH.

THE telling-room and other accommodation of the Royal Bank, St. Andrew's-square, having been found inadequate to the business requirements of the establishment, an extensive addition to the premises is now being made, from designs by Messrs. Peddie and Kinnear, of Edinburgh. The new building in course of erection is situated immediately behind the bank, and is square in figure. It consists of a sunk floor, of a story on a level with the ground floor of the bank, and in part of a floor above. This addition will contain a telling-room of large dimensions, rooms for book-safes, plate-safes, &c.; and a suite of apartments—such as officers' rooms—and a library, some 70 feet long and 23 feet wide. The whole of the sunk floor is strongly arched with brick; and the flooring of the upper story is to be laid upon corrugated iron plates, which form arches resting upon wrought-iron beams. The accompanying engraving represents the telling-room, the most prominent object in the design. It is placed directly opposite, and is on a level with, the main entrance to the bank, from which it will extend west upwards of 70 feet. The room forms a square, about 60 feet every way, with a recess nearly 30 feet wide and 13 feet deep on the east and west sides. These recesses are surmounted by semicircular arches. A dome, formed by malleable iron ribs, secured at the base by a malleable iron ring, covers the central or square part of the room. By means of this dome, according to the plans, it is proposed to light the apartment. The dome is to be filled with star-shaped lights, distributed in geometrical concentric rings, diminishing in size as they approach the centre, which consists of a large circular light. This feature gives a peculiar character to the design. The floor of the telling-room will be laid with encaustic tiles, and the tables and fittings will be of polished mahogany.



THE TELLING ROOM, ROYAL BANK OF SCOTLAND, EDINBURGH.—MESSRS. PEDDIE AND KINNEAR, ARCHITECTS.

THE TYNE DOCKS.

INSTITUTION OF CIVIL ENGINEERS.

ON May 3rd (Mr. Bidder, V.P. in the chair), the paper read was "On the Tyne Docks at South Shields, and on the Mode adopted for Shipping Coals," by Mr. T. E. Harrison. He said:—These docks had been constructed on the banks of the river Tyne, at the upper end of South Shields, on a large area called Jarrow Slake, which was covered with water at spring tides to a depth of from 5 feet to 8 feet. The area so covered amounted to about 350 acres, and of this quantity 179 acres were now inclosed. The area of water in the dock, as executed, was 50 acres, the depth of water being 24 feet 6 inches at an average spring tide. The entrance basin was 9½ acres in extent, with a depth of water of 25 feet, for a width of 200 feet in the centre of the channel, gradually shoaling to the sides. One entrance had a width of 80 feet, and there was a lock 300 feet in length and 100 feet in width, with gates 60 feet in width: the cills in each case were laid 24 feet 6 inches below high-water of average spring-tides —such spring-tides having a lift of 14 feet 6 inches.

The total quantity of excavation in the docks was 1,783,452 cubic yards; and in forming the standage ground, 281,305 cubic yards. The total quantity of masonry of all descriptions was 2,900,000 cubic feet. The cost, up to the date of the opening for public traffic, was 440,476*l*. This sum included all the standage and railway approaches, the shipping jetties, the purchase of land, and all the dock-works; but it excluded parliamentary and other charges, not engineering. The works were under the immediate superintendence of Mr. Robert Hodgson, as resident engineer; and the contract for their execution was let to Mr. James Gow.

The first point of engineering interest was the nature of the foundations. A series of careful borings showed, that though there was in places a strong, stony clay, resting on the coal measures, yet that this clay was very partial, dipping suddenly away. Within a few yards of the clay-bed borings were made, to a depth, in some places, of 70 feet and upwards, through the mud, or slake deposit, without getting bottom; showing that not only the clay, but the coal measures, were gone. The original level of the ground was ascertained to be 10 feet below the lowest ebb of a spring tide at the present time, confirming the opinion that a general depression of the east coast had taken place.

The first operation in the construction of the works was to form a culvert, 5 feet in diameter, round the head of the dock area, to receive and carry off the upland waters. Dams were then formed of the materials from the excavations, consisting partly of clay and partly of slake, and after their completion, the water was run off by sluices. Shortly after the first course of masonry of the foundations was laid for the north, or 60-feet, lock, the floor was observed to rise very regularly, about 3 inches in the centre. A bore-hole was then put down, when a strong feeder of water came away. The hole, therefore, was kept open during the progress of the works, and similar holes were made in other places. The flooring of the lock went back, partially, after the hole had been open several days; and it was brought nearly to its original level, by being weighted with stone.

In building a quay wall opposite the Jarrow chemical works, it was found that the slake would not bear the weight of the bank behind it, unless at a slope of 1 to 5. As so flat a slope was inadmissible, the plan adopted for overcoming the difficulty was by weighting the top with gravel—by which the toe of the slope was forced out. It was not until 150,000 tons of gravel had been deposited that the whole came to a state of rest. The slope was at present 1¼ to 1. It was pitched with stone, and rested at the bottom on a strong row of piles.

With a view of testing, practically, the sustaining power of the mud, or slake, a bed of concrete, 10 feet square, was gradually loaded with iron, to the extent of 7 cwt. per superficial foot, without any settlement taking place; but as soon as that weight was exceeded, the whole began to sink. The foundations of the timber jetties, for the shipment of coals, were therefore laid on a wide-spread base of concrete, with timber cill pieces; care being taken not to exceed a weight of 5 cwt. per superficial foot. It was satisfactory to be able to state, that there had not been the slightest appearance of settlement.

Immediately below the entrance to the tidal basin there was a canch of hard clay, running out into the river. This had been entirely removed by dredging, and the flood and ebb tide now took their course, as nearly as possible, over the same channel, guided by the concave river wall. The latter was entirely constructed of creosoted timber, by means of one of Nasmyth's steam pile engines. A description was then given of this machine, which was so arranged that it formed its own roadway throughout; and it was remarked, that where there was a large amount of straightforward piling, or in cases of difficult driving, this machine was without an equal.

The dock gates were, generally, on the same plan as those of the Victoria (London) Docks. The only difference was that the Tyne Dock gates were curved both on plan and in section, the pivot of the heel-post being raised 3 feet 6 inches above the level of the cill. There was thus less danger of anything lodging behind the heel-post, and the invert of the lock was carried right through from the end of the pointing cill. It involved, however, some large and rather intricate masonry, and necessitated great accuracy, in fitting the doubly-curved wood cills to the doubly-curved masonry; but this had been successfully accomplished, and the cills were perfectly tight. One of the advantages in the use of wrought iron for dock-gates was that, from their flotation, the weight on the rollers might be adjusted at pleasure. The sluices were all made to work with brass against brass. The dock-gates and sluices were arranged to be worked either by hand or by hydraulic power, the machinery for the purpose having been furnished by Sir W. G. Armstrong and Co.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE ordinary general meeting of members was held on Monday last, at 16, Grosvenor-street.

Mr. Hussey, V.P. occupied the chair.

Mr. C. C. Nelson (honorary secretary) read the minutes of the last meeting, which were confirmed, and also a list of donations, including a contribution from Mr. Wightwick, illustrative of a lecture, and containing his rough and finished sketches in Italy; and mounted photographs of Mr. Spurgeon's proposed Tabernacle, and interior of St. Luke's Church, Heywood, Lancashire, by Mr. J. Clarke.

A vote of thanks having been passed to the donors,

The Chairman read a letter from Earl De Grey, president of the Institute, returning thanks on his re-election to the office of president for the ensuing year.

The following communication from Professor Donaldson was also read:—

Bolton-gardens, 14th May, 1859.

MY DEAR SIRS,—I have to acknowledge the receipt of your letter of the 4th instant, conveying the very gratifying estimate which the Institute so indulgently take of my services as their secretary for foreign correspondence, and for which I am deeply obliged. I must ever take a cordial interest in the success of the Institute, as the character of the profession and the progress of the art in this country must be deeply affected by the wisdom and discretion with which its proceedings are conducted. I trust that its constitution will never be materially altered. An adherence to the wise principles on which it was originally founded has produced its unvarying success up to the present moment, and the exalted position it now occupies, not merely as an English, but as a European institution, known and respected throughout the world.

There is no other body in the profession of which the same can be said: not one equals it in rank, importance, and success. Experience has, therefore proved the soundness of its construction after nearly a quarter of a century of existence.

The report read at the annual meeting alludes to the change of apartments, and the generous donations in connection with that circumstance from the noble president and other liberal members. I beg, therefore, humbly to imitate their example by offering a contribution of 25*l*. towards the expense of removal, and also another 25*l*. to be added to the "Travelling Students' Fund," the principal of which I trust the council will never allow to be touched or diminished, as the founder, Mr. Newman, myself, and other contributors have added to it under that impression; and I trust it may eventually become sufficient to assist materially our travelling students in their studies abroad.

Believe me, my dear Sirs, very faithfully yours,

THOMAS L. DONALDSON.

To Messrs. Nelson and Lewis, Honorary Secretaries.

Mr. T. H. Lewis then read an interesting paper "On the Construction of Domes," illustrated by numerous diagrams and sketches.

Mr. Nash expressed his approval of Mr. Lewis's remarks, and his regret that architects in general were not more uniform in their opinion on this important subject. Domes, provided there was a solid foundation for them, were the easiest things for the architect to construct; and he believed that, in cases where cracks or other defects had been found in them, these were to be attributed to a shifting foundation, and not to any inherent defect in the dome itself. The theory with respect to ordinary arches and domes was not the same, for the dome contained so much more material at the base than the apex, that it had comparatively little to carry, while the arch had a great deal. He would not fear to build a dome double the size of the dome at Bejapore (shown in a diagram), with three tiers of tiles, provided he could get a good foundation.

Mr. Lewis.—The dome is easy enough to construct, if you have no light at top. The difficulty is to construct it so that it will bear the weight of a heavy lantern, such as that at St. Paul's.

Mr. Nash said he wished to add a word on the subject of snow. He could not believe that snow, composed as it was, could do any building harm. He had tried experiments, many years ago, to show that the fall of snow on a roof was not of the gravity generally supposed.

Mr. Lewis.—I have known it to break down a roof of galvanized iron.

Mr. Mathews said that snow was not a very heavy material to deal with, as it descended in feathery flakes; but when it began to thaw, and then to freeze, it became a very heavy substance. He should have liked, were the hour not so late, to offer some observations on the paper of Mr. Lewis, especially as he did not agree with him, but would reserve them for a future opportunity.

Mr. C. H. Smith observed that snow was generally considered a very heavy substance, but that from experiments he had made he found that twenty inches of snow were equal to only one inch of thawed water. He had also made experiments with hail as compared with snow, and he found the former to be of much greater specific gravity and far more damaging in its effects upon a roof, as it was sometimes accompanied with lumps of ice as big as a marble. On the subject of arches, he confessed he was astonished to see the determination of architects and builders to make arches of half-brick rings. He was also surprised to find railway arches constructed of half-bricks, with no bonding between them. He found upon consulting some written descriptions, made during the erection of St. Paul's Cathedral, that Sir Christopher Wren had caused the bricks for the dome to be made two feet long, in order to go through the arch. This was not, he believed, generally known, but he mentioned it on the authority of a statement printed about the time. With regard to tile arches he was astonished on going over "Bridgewater House" to find arches of only two tiles in thickness. He saw them put in dry and dusty, without any water to make the cement adhere, and yet their strength was amazing. He pointed this out to an architect who was with him, and he jumped upon the arch with his whole might, and said, "See, it is strong enough!" and it was strong enough, for he did not go through.

Mr. Penrose said he was glad to perceive that Mr. Lewis had left the theory of Robinson to fall upon practical conclusions. The principle of an arch should be considered with reference to the thrust of the strength line. He was surprised that in the construction of railway works the Roman construction of bricks, 20 inches deep, had not been followed in preference to the half-brick rings. Many of the Roman vaults were constructed with large bricks, and the interstices filled in. With regard to the comparative force of hail and snow, any one could test it by going into a hail-storm with an open umbrella.

The Chairman asked Mr. Smith whether in practice he had ever known a roof beaten in by hail.

Mr. Smith said he had not, nor had he made the assertion. What he contended was, that hail was far more dangerous to a roof than snow.

Mr. C. Fowler, jun. said it struck him with regard to domes, that two principles of construction had been mixed up—one that of the dome, and the other that of the vault. It appeared to him that the domes at Bejapore and St. Paul's were real domes, but he thought the latter was continuous, and was not interrupted by ribs. The principle laid down by Mr. Lewis must, in his (Mr. Fowler's) opinion, be modified before it could be applied to continuous domes. It seemed to him that the dome, unless over-weighted at top, did not require any "tie" at all, and he questioned whether that of St. Paul's required any such security. It was constructed upon the real principle of the dome. Eastern nations appeared to have made their domes without centering, and, from the model preserved at Bejapore, they were of great strength. The theory laid down by Mr. Lewis appeared to him to apply to the dome of St. Peter's, but not to that at Bejapore.

Mr. Smith inquired whether the ties of the dome of St. Peter's were of iron.

Mr. Lewis replied in the affirmative.

Mr. Smith.—Then I presume it is the same at St. Paul's.

Mr. Lewis.—It is.

Mr. Smith.—Then, in case of the dome being struck by lightning, the whole work might be destroyed.

Mr. Penrose said the contingency referred to by Mr. Smith was provided against, both in the case of St. Peter's and St. Paul's, by the introduction of lightning conductors.

A vote of thanks was then, on the motion of the chairman, passed to Mr. Lewis, and the meeting adjourned until Monday, the 30th inst.

CHIMNEYS AND FLUES.

MR. JOSEPH GLASS, of Brixton, has forwarded us some observations on the construction of flues, with a view to obtaining the avoidance of slants and horizontal positions, so as to permit the efficient working of the chimney-sweeping machine, with a view to the disuse of climbing boys. He says:—

"To render buildings safe from fire, much depends on the construction of the flues: for instance, if the flues are made perpendicular, or nearly so, and without angles or lodgments, in this case there would be little or no danger: on the contrary, when flues are made in an angular form, some parts being horizontal, and which are designated by the climbing boys 'dead slants,' in this case the building cannot be pronounced safe. It will be found that, whatever means are adopted to sweep these flues, much difficulty will arise in clearing them properly, although the parties employed may use their best endeavour to do so. In the examination of flues of this description, I have found a considerable quantity of soot collected at these angles and slants, after being swept by the climbing boys. The only effectual plan is to introduce a soot-door into the side of the slant, when the slant and angle could be properly cleaned. But this is attended with inconvenience to the parties concerned, and would not at all be required if flues were made in a proper manner; and there can be no reasonable excuse why flues should not be made so in the construction of buildings in future. A deposit of soot lodged at an angle is not unfrequently ignited by a single spark, and may smoulder for hours and days together, till the whole is ignited; and, as the heat increases in intensity, the brickwork becomes red hot, when the fire is readily communicated to the timber or flooring found in close contact: it is in this way that numerous fires have occurred, and the result has been the loss of much valuable property, and in not a few instances a sacrifice of life. From long experience, I feel assured that some better and safer plan in the construction of chimneys and flues is much wanted.

Considerable danger from fire is often occasioned from alterations, particularly in business premises, in appropriating rooms and apartments that were formerly used for domestic purposes into store-rooms: in some cases it is decided to line the walls with boards, to which shelves may be attached; and, in order that the frame-work may be secure, carpenters will drive wedges of wood into the cross joints of the brickwork, and the ends of these wedges will sometimes find their way into the flues; and should this be the case where there is a lodgment on which there is an accumulation of soot, a spark may at any time ignite it, and fire by this means be communicated to the wedge, and from thence to the lining boards, and from thence to the shelves, till the room and premises become a prey to the flames. In several cases I have been called in to examine flues, where an escape of smoke has been perceived, and I have found that it has been generally produced from wedges being driven into the brickwork in close connection with the flues, and in some cases at an angle, with the end of the wedge projecting into an accumulation of soot, when, should the soot have ignited in this case, or the chimney have taken fire, but little hope could have been entertained of the safety of the building.

In order that the community at large may be rendered safe, and their property secure, chimneys and flues in all buildings erected in future should be formed without angles, slants, or lodgments of any kind. This does not imply that chimneys should be made perfectly upright: flues may deviate a distance of 10 or 15 feet, if required; but instead of slants and angles, well-regulated curves should be adopted, allowing the machine to pass freely to the top, when the soot in this case would all be brought down into the fire-place, and masses of smouldering soot, under these circumstances, could never again occur."

We fully agree with Mr. Glass as to the necessity for greater care in the construction of flues and chimneys than is often exhibited.

RAILWAYS IN SPAIN.

THE railway from Alcala to Guadalajara, is to be inaugurated by her Majesty, Isabella II., in person. The ceremony will take place very shortly, and preparations are being made for a magnificent display.

The plans of the line from Madrid to Saragosa have been approved of by the Spanish Government. They are going to push forward the works.

It is asserted that the administration of the Alar and Santander Railway, and M. Andrade, nephew of M. Pereire, of the Credit Mobilier, have agreed upon conditions for the transport by the new railway as far as Alar, of 150,000 tons of material for the Northern Spanish Railway; 55,000 to be carried this year, besides 15,000 tons of mineral ore, to be brought in the return trips to Santander from Torrelavega. This important movement of traffic will prove of immense advantage to all interested in the enterprise of the Alar and Santander Railway.

A company has been formed, to construct a railway from Aguilar de Campóo to Vergano, and to develop the magnificent coal-beds of the valley of that name, and of the Vecilla. Among the persons at the head of this most important scheme, are D. Fernando Penelas, proprietor; D. Joaquin Ganido, deputy for Hulva; D. Eugenio Garcia, ex-deputy; and D. José Fallos, accountant-general of the Chancellor of the Spanish Exchequer.

A concession has been granted to Don Pedro de la Pedraja, for surveys of a projected new line of railway from Caceres to Merida; and to Don Mariano Bazan, for those of a line from Palma to Ecija. At the same time was conceded to D. Juan Bantista Peyronet, an extension of time—four months—for the completion of the surveys for a canal of irrigation, to supply water for the use of the districts of Elche, Crevillente, Elda, Novelda, San Vicente, and others of the province of Alicante.

SUSSEX ARCHÆOLOGICAL SOCIETY.

THE quarterly meeting of this society was held at Uckfield and Buxted, on the 12th inst. The meeting, seventy or eighty in number, assembled at the Maiden's Head Hotel, Uckfield, at half-past twelve, when Mr. Morgan, of Uckfield, was called to the chair. After the election of several new members, the Rev. E. Turner read a paper "On the Antiquities of Uckfield." The few relics of the past which the town contains were so described as to form a very interesting paper. Mr. Lower then read a short description of an effigy, supposed to be that of Sir Edw. Dalyngruge, the founder of Bodiam Castle. Lord Chichester had offered to present it to the museum at Lewes Castle. Mr. Durrant Cooper regretted that Mr. Turner's paper had contained no allusion to the probability of Shakspeare and some of his illustrious contemporaries having been in some degree associated with Uckfield by their known intercourse with the Woodwards. He hoped that that point would be worked out by the society. The mention of Shakspeare's name reminded Mr. Lower that a member of the society, Mr. W. Gosling, of Heathfield, had lately become the fortunate possessor of a copy of the renowned "first folio." He had picked it up at a neighbouring sale, for less than waste-paper price.

The archæologists then proceeded, under the guidance of the Rev. E. Turner, to visit a few points of interest in the town, viz. the old bake-house at the corner of Church-street, with its architectural remains, traditionally said to be a portion of a prison,—a Mediæval chimney-piece, with wainscot and painted panels in a cottage in a lane leading out of High-street,—and the library of Dr. Saunders, the founder of the Uckfield Free School. The party next visited Maresfield church and the rectory, where the Rev. E. and Mrs. Turner had spread their tables with an interesting collection of local antiquities, and with a cold collation. The party then proceeded towards Buxted-park. The old church, with its brasses, was first inspected, and afterwards the gardens and conservatories of the mansion of Col. C. Harcourt. The next point was the "Hog House," on the outskirts of the park, celebrated as the ancient abode of Ralph Hogge, the first founder of cannon in England, and having his *rebus* of a hog on its front wall. The tourists next visited Buxted Rectory, and the "Hermitage," at Buxted Rocks.

This little-known relic of an unknown age, consists of two principal chambers, hewn out of the solid sandstone rock: a large ante-room leads to the principal apartment, in which there is a hearth, with a perforation above for a chimney: a flight of steps leads upwards from one corner of the apartment to the *cubiculum* of the hermit, into which he must have passed on all-fours, through a small aperture. The company then retraced their way to Uckfield, where a cold collation awaited them at the Maiden's Head, and forty-two ladies and gentlemen, including most of the local gentry and the leading members of the society, sat down. Very little was done in the way of speech-making.

LITERARY AND PHILOSOPHICAL SOCIETY OF MANCHESTER.

IRON IN BUILDINGS.

THE annual meeting was held on the 19th ult. Mr. W. Fairbairn, president, in the chair; when the council's report, read by Dr. Schunck, said, that at no period of its existence had the society been in a more flourishing condition.

At the last annual meeting, the society consisted of one hundred and eighty-one ordinary members. Since then one has resigned and three have died, whilst twenty-one new members have been elected, making the number at present on the list one hundred and ninety-eight.

The statement of accounts showed a balance to the general account of 94*l.* 9s. 2½d. and to the library special fund of 45*l.* 1s. 6d.

At a meeting held on the 3rd of May, Mr. H. M. Ormerod produced two specimens of iron used in building, which had both become oxydized so as to injure the buildings which they had been used to strengthen. One was an iron cramp, taken from the north-west buttress of Manchester Parish Church, about 1 foot long and 3-8ths of an inch thick. This had become treble the thickness by rust, and had split the buttress, in the centre of which it was inserted, lifting about 12 feet of wall. It had been inserted about ninety years since. The other, a small wedge, from the steeple of St. Mary's Church, in Manchester, was about 3-8ths of an inch thick at the broad end originally, but now 7-8ths. These wedges had lifted all the stones which they were meant to keep in their places, splitting some, and allowing all the rain to penetrate. The steeple was erected about 1756, and the upper part has now become so ruinous and dangerous from the original faulty construction, and the expansion of the iron cramps and wedges, that it is being taken down, pursuant to notice from the city surveyor.*

FATAL FALL OF SCAFFOLDING AT WESTMINSTER PALACE HOTEL.

ON Friday the 13th, about half-past six in the morning, an accident, which caused the death of six men, and injured seven others, happened at the Westminster Palace Hotel, now in the course of erection by Mr. George Myers, under Messrs. Moseley, architects, at the corner of Victoria-street, Westminster. A view and plans of the building will be found in our pages. It has been carried up to a considerable height in a substantial manner. Within there is a quadrangle to light and give air to surrounding apartments, and in this stages were formed for the men to work on. The top stage, at a height of perhaps 70 feet from the ground, consisted of timbers somewhat slight laid from wall to wall at certain distances, on which were placed scaffold-boards, and on the platform thus formed materials were piled and the men worked. It is stated, that at one time there were uprights from a stage below to support the pieces of timber in the middle. By some means, yet to be learned, these had been removed, and a certain weight of bricks and Roman cement having been placed upon the platform, when the men went to work in the morning, the cross-pieces broke, and the men were precipitated to the ground with the materials, and suffered in the manner already described.

An inquest on the bodies was opened on Saturday last, when Mr. A. Ashpitel was appointed foreman. The bodies having been identified, it was adjourned for a few days, when a careful inquiry will be made.

Sir C. Russell said, as deputy chairman of the

* After grinding and polishing the iron rust, it presented a black iridescent surface of almost metallic brilliancy, and similar, in appearance, to Elba ore. It was capable of being made into a magnet of considerable power and retentiveness.—J. P. J.

directors of the Westminster Palace Hotel Company, he attended there to say that the directors were most anxious to afford every facility to the jury, in order to forward the end they had in view. The directors were exceedingly distressed at the unfortunate occurrence, and it was their intention to contribute in a liberal manner to the wants and necessities of the wives and families of the deceased; indeed, the fact was, that a subscription was now on foot amongst the shareholders, which he had no doubt would be responded to in a manner that would testify to their sympathy for the families of the sufferers generally, and those who were dependent upon them.

Very considerable excitement prevails, and blame has been loudly attributed, but we have not yet learnt on what grounds.

FALL OF SCAFFOLDING.

IT is to be deplored that, with all our legislative and municipal care respecting buildings of this great metropolis, so many fatal accidents occur yearly. At one time it is the shute of a warehouse, or mansion in course of construction; again, of a cornice impending above a causeway; and then of the whole temporary contexture of a scaffold!

There are many municipal rules and provisions of our Parisian neighbours which it would be well for us to imitate; and their regulations as to scaffolding are of them. It is the custom there to hire out scaffolding for the use of builders, and the strength of the poles or scantling is fitly proportioned to the height of the structure in progress: each piece is numbered, and furnished with bolts or pins, so as to fix the skeleton firmly together, planks being also provided to complete the stages; and the whole fabric may suddenly be extemporized or removed at a notice of only a few hours. With such an arrangement, but little trust is reposed on lateral support, and therefore there is no pressure upon the raw brick-work, such as we find to be the case in all the lapses that take place amongst the first of our enterprising builders and contractors.

This hint is given by an amateur observer upon edification everywhere; and it is modestly suggested to the wise concoctors of that incomprehensible production called the "Metropolitan Building Act," to take a leaf out of the Gallic digest, and by that measure to protect the lives of those who labour for our comfort.

It is lamentable to reflect that six workmen were instantaneously killed by the fall of the Victoria-street scaffold trap, and that the widows and infants of several of them are now actually thrown upon parish relief for existence. If there is a charity more imposing, more crying for pity than another, it is this, that the helpless orphans and the widows of industrious labourers, hurled to an instant eternity while toiling for their support, should, in their calamitous bereavement, be solaced by at least a modest competency. Will not the *Builder* receive contributions from the public? Many who can afford it will be delighted to assuage their sorrow. Five shillings is as much as can be afforded by QUONDAM.

SETTING OUT CURVED TUNNELS.

IN No. 759 of the *Builder*, there is inserted a communication from a correspondent, "On tracing curved tunnels." The subject is one of considerable importance with reference to works now in progress, and knowing practically how far the commonly received methods of laying out curves will obtain in the matter of sewer building and tunnels, I am induced to send you the details of a method much more applicable to such operations, and where from the nature of the ground, it is impossible to locate the complete curve even approximately, or to set out more than one short length at a time.

The following method requires the *radius only* to be given or ascertained, dispensing with the ordinary requirements of the angle formed by the tangents produced, the degrees in the whole length of curve, and the use of offsets.

In sewer building, for instance, it is usual to construct the bottom, or invert, in certain convenient lengths, and the levels, and also the amount of curvature (if in a curve), have to be determined for each length as it occurs, perhaps before the ground for the length in advance has been got out to invert depth.

The length of bottom proposed to be constructed at one time being assumed, a line joining the extremities of the axis will be a chord of the arc, and the base of an isosceles triangle, the sides of which are radii of the curve.* On finding the radius by scale, or by

$$\text{rad.} = \frac{\frac{1}{4}\,\text{chord}^2 + \text{versin}^2}{2\ \text{versin}}$$

we obtain a triangle, the sides of which are known, and the angles of which may be found.

Half the angle at the apex—that which would be at the centre of the circle of which the curve forms a part—will be the amount of deflection necessary to be made and repeated from the tangent or starting point, for every length of chord put in. In this way a circle may be located with great rapidity and accuracy, as the whole 360° of the curve may be found, without once shifting the instrument, and in sewers or tunnels, until the side of the work obstructs the sight.

One example of this method will suffice to make its working out clear.

Let the base or given chord be called a, and the other sides of the triangle b and c; and the angles opposite the sides severally A B and C. It is required to find the value of the Angle A.

Without giving the intermediate steps, take the expression in terms of the sides and angles

$$\text{Cos. A} = \frac{\text{rad.}\ (b^2 + c^2 - a^2)}{2\,b\,c}$$

put into convenient form for calculation.

$$\text{Sin.}\ \tfrac{1}{2}\,\text{A} = \sqrt{\frac{\text{rad.}^2\,(a+b-c)\ \ (a-b+c)}{4\,b\,c}}$$

$$\text{Log. sin.}\ \tfrac{1}{2}\,\text{A} = \tfrac{1}{2}\,(\text{log. rad.}^2 + \text{log.}\ (a+b-c) + \text{log.}\ (a-b+c) - \text{log. } 4 - \text{log. } b - \text{log. c.})$$

Let $a = 10$ feet, and b and c (radii) each 100 feet, we have on working out—

Log. rad.^{2} = 2 log. rad.	=	20·0000000
Log. $(a+b-c)$ = log. 10 =		1·0000000
Log. $(a-b+c)$ = log. 10 =		1·0000000
		22·0000000
From which subtract—		
Log. 4	=	0·6020600
Log. b. = log. 100	=	2·0000000
Log. c. = log. 100	=	2·0000000
		4·6020600
Leaving		17·3979400
Divided by 2		8·6989700

= log. sin. ½ A, or 2° 52′

The whole angle A = 2° 52′ × 2 = 5·44 = the degree of curvature for a chord of 10 feet, radius 100 feet.†

As before mentioned, the degree of deflection from the tangent or starting point, would be half the angle A or 2° 52′; but as this would involve on repetition a certain amount of careful calculation, and a very particular use of the vernier scale, it would be better in practice to take the nearest whole degree angle for A, and increase or diminish the given or assumed length of chord accordingly. In this instance, take the angle A = 6°, and find the length of base required, as follows:—

$$a = \frac{c \times \text{sin. angle A}}{\text{sin. angle B or C}} = \frac{100 \times \text{sin. } 6^\circ}{\text{sin. } 87^\circ}$$

$$\text{Log. } a = \text{log. } 100 + \text{log. } 6^\circ - \text{log. } 87^\circ$$
$$= 1{\cdot}0198302$$
$$\therefore a = 10{\cdot}467 \text{ feet, or 10 feet 6 inches nearly.}$$

Should it be found necessary, from the nature of the works, occasionally to put in a longer or a shorter chord, the central angle, as is evident, will have to be calculated for that particular chord, deflecting from the commencement of the chord, and proceeding as before, or with other different lengths, as the case may demand.

The application of the above method is plain. By it, it is possible to set out every additional length of the axis of the work, without reference to the portions in advance. The angle of deflection (half the "central" angle A) is to be set off for each equal length of base as long as the sight is unobstructed. When this occurs remove the instrument to the last forward point, the reading on the limb unaltered, reverse the telescope, and look back, *double the reading*, look *forward*, and commence as before, as from a new tangent-point; and repeat this operation as often as it may be necessary to change.

It would be convenient and advantageous, in many cases, to construct a mould of the curve of some half-dozen lengths of bottom or base, of wood or iron rods, so as to be able to set out forward lengths by making the remainder coincide with the work already done, and testing with the instrument as often as convenient. In this manner the instrument would not be nearly so often required in setting out, delay might be avoided, and errors, to which the best of methods is liable, would be prevented.

The above may be of use to parties engaged in works such as those I have referred to, and with that impression I respectfully submit it for insertion. J. WALKER WILKINS.

* In the United States of America, and in some parts of the Continent of Europe, curves are commonly located upon the principle of the ratios of the base for every degree of verticle angle of the isosceles triangle. This principle can be applied in every case that can be resolved into such a triangle of which the two sides and the contained angle or one side and one angle are known.

† It is of the utmost importance to obtain the central angle correctly, as on it depends the whole operation. It would be well if the assistant obtained the value of one of the angles at the base, doubling it and deducting from 180°. If the remainder equal the result of his previous calculation for central angle, he may be sure he is right before he goes ahead. This is an important check. The value of angles B or C may be arrived at by

$$\text{Log. sin. } \tfrac{1}{2}\,\text{B} = \tfrac{1}{2}\,(\text{log. rad.}^2 + \text{log. } (b+a-c) + \text{log. } (b-a+c) - \text{log. } 4 - \text{log. } a - \text{log. } c) = 9{\cdot}8383468 = 43^\circ\ 34'.$$

The whole angle B = 43° 34′ × 2 = 87°·08′.

The angles at the base of an isosceles triangle being equal, the angle A would equal 180° (87·8 × 2) = 5° 44′, a result proving the correctness of the first operation for angle A.

CHURCH-BUILDING NEWS.

Peterborough. — A stained glass window, in memory of the late Mr. John Hewitt Paley, solicitor, has been inserted in the north transept of Peterborough Cathedral. It is by Hardman, of Birmingham, and contains two lights; one representing St. Peter walking on the Water; the other St. Paul preaching before Festus. There are two other windows adjoining, and it is a matter of regret, remarks the *Cambridge Chronicle*, that money cannot be raised to decorate these also, which might be done at a cost of about 100*l.* as a series of five stained windows would thus be obtained, two being already inserted in the morning chapel or aisle of the north transept.

Saffron Walden. — A subscription has been opened for the restoration of the interior of Saffron Walden Church. It has long been disfigured by fittings out of character with the building, and these are to make way for others upon a plan furnished by Mr. Richard C. Hussey.

Corfe Castle.—The contract for the restoration of Corfe Castle, says the *Dorset Chronicle*, is taken by Farwell and Meadus, the former a builder of Swanage, the latter of Poole. The work has been commenced.

Bristol.—St. Raphael's church, on the Cut, for the use of sailors, has been opened for Divine service. It has been erected as a memorial church by the Rev. R. Miles, at his sole expense. The building is in the style of the thirteenth century, built of blue Pennant stone, with Bath stone dressings, and contains sitting accommodation for about 350 persons. The church consists of a nave and chancel, with north and south aisles, the chancel partitioned off from the nave by an oak moulded and tracery screen. At the east and west ends are two large windows, the edifice being further lighted by means of eight small two-light windows in each of the aisles, two clerestory windows on either side of the chancel, and five clerestory windows each side of the nave, while over the east window is a small one of two lights in the gable above. The east window is of stained glass, by Hardman, of Birmingham. The subject for the upper portion of the window is taken from the 4th chapter of Revelations, and represents the four-and-twenty elders casting their crowns before the throne. In the centre of the lower part of the window is the Crucifixion, and at the sides are the four Evangelists. There is also in the chancel a south window of stained glass, by Hardman, on which various scriptural subjects are displayed, such as the stilling of the tempest, the miraculous draught of fishes, &c. The clerestory windows in the chancel are of coloured glass, by Powell and Son, of London. The windows are of moulded tracery work, glazed in various patterns with green and white glass. The roof is supported by a north and south arcade, consisting of seven arches of Bath stone, moulded, and supported by shafts of blue Pennant stone, with moulded caps and bases; the front portion of each arch, where it springs from the shafts, being carved with bunches of sea-weed, anchors, and nautical devices. The chancel arch springs from two small shafts or corbels, and is moulded. The roof timbers, which are exposed to view, are stained and varnished. The chancel is lined with Bath stone, and the floor paved with encaustic tiles, and the walls of the nave and aisles are stuccoed of a warm colour, the floor being paved with Staffordshire tiles. The seats are all open. The reredos is of Derbyshire alabaster

and red and green serpentine marble, with panels of foliage picked out with gold and colour, in the centre one being a cross, surrounded by diaper work. In the north aisle of the chancel is placed the organ, which was built by Bryceson and Son, of London. The pulpit is of Derbyshire alabaster, carved and relieved with gold, with carved angles of Caen stone, representing the prows of ships, on which the pulpit is supported. St. Raphael's college, adjoining the church, at present consists of almshouses for six seamen and a chaplain's residence. Each house contains a sitting-room, 14 feet by 10 feet, and a small bedroom and scullery on the north side. The style is Gothic, to correspond with the church, but the houses are built of ornamental brickwork, and in front there is an ambulatory or covered way of oak. The grounds in front of the church and college are to be laid out in an ornamental manner, and at the back is a terrace 400 feet long and 7 feet wide, from which an excellent view of the harbour may be obtained. The church and college have been erected from designs by Mr. H. Woodyer, of Guildford, architect. The contractors were Messrs. J. and J. Foster, of Bristol, and the work has been carried on under the superintendence of Mr. George Redfern, clerk of the works. It is estimated that the cost of the church and college will be about 10,000*l.*

Framilode.—The roof of Framilode Church has been illuminated, and the whole of the windows have been filled with stained glass by Mr. Rogers, of Worcester, at the cost of the rector of Fretherne, the Rev. Sir L. Darell, bart.

Broughton.—The new church at Broughton, which has been erected on a higher and drier site than the old, has now been consecrated by the Bishop of Lichfield. The church, according to the *Shrewsbury Chronicle*, has been erected from the designs of Mr. T. D. Barry, of Liverpool, and is a small unpretending building. The style is Early Decorated. The roof is open; and there is a bell turret, which contains the bells from the old church. The old font is also preserved.

Sutton St. Nicholas.—The Church of Sutton St. Nicholas, near Hereford, having undergone considerable repairs, has recently been formally re-opened. The old pews have been reinstated, with uniform open seats of deal, stained. The blank wall, which formerly existed between nave and transept, has been removed, and a second arch substituted, by which a much larger area has been rendered available, and the interior effect improved. The aisles have been relaid with ordinary tiles and paving, intermixed; the chancel within the rails, with Godwin's encaustic tiles. The walls and stonework have been cleaned, and the windows reglazed with obscured glass. The seats have been increased from 120 to 170. The architect employed was Mr. John Clayton, and the contractor, Mr. Beavan, of Hereford.

Retford.—The church of St. Peter, at Hayton, near Retford, was reopened on the 5th inst. It has just undergone almost a complete rebuilding, so far as the nave, side aisle, porch, and chancel are concerned, to which must be added a new roof, and a new ceiling (in the same style as East Retford Church) of the nave and side aisles, as well as a new floor. There has also been supplied a new pulpit of Caen stone. Mr. Lee, of Retford, was the contractor.

Rotherham.—Maltby Church has lately undergone a restoration, and has been reopened. The style of the present building is continental, more of Italian Gothic than anything else. The old church was encumbered with the usual unsightly galleries, and altogether in a state calling for urgent renovation. With the exception of the tower and spire, all has been rebuilt, consisting of nave, chancel, and transepts, and the seats are entirely upon the ground-floor. The work has been carried out, under Mr. Philip Boyce, of London, the architect, by Mr. George Chadwick, of Masbro', the contractor. The east window is of stained glass, by Mr. Drury, of Sheffield, and the gift of Miss Lucy Rolleston.

Edinburgh.—The foundations for a new church for free St. Mary's congregation, in lieu of the building in Barony-street, are being prepared. The site of the new church is at the east end of Albany-street, on a vacant space which, as our authority, the *Scotsman*, observes, has long been an unsightly object in that part of the city. To twelve architects in Edinburgh, Glasgow, and elsewhere, premiums amounting in all to 100*l.* were offered for the best three designs. The plans now being carried out are those of Mr. J. T. Rochead, of Glasgow, to whom the first premium was awarded. In style and plan the new church is Mixed Perpendicular of the time of Henry VII. The site is open to view on all sides. The frontage in Albany-street, including dwelling-house at west end, is not less than 140 feet by a breadth of 70 feet over the walls in Broughton-street. The east end, which forms a pentagonal apse, has a clerestory above. In Albany-street is the principal entrance, rising over which is a tall tower and spire. In the principal parts the side walls of the church are heightened by alternations of buttress and window—the former pinnacled and crocketed, and the latter filled in with tracery and mullions. Internally, the chief features consist of a nave and side aisles, with semicircular apse and Tudor-arched ceiling, banded into moulded ribs, with bosses at the intersections. Iron pillars, moulded, divide the nave and aisles. The area of the church and galleries contains 1,000 sittings; and in the basement story, which enters nearly from the level of Broughton-street, there is space for class-rooms, retiring-rooms, beadle's house, &c. The church, the building of which has been entrusted to Messrs. A. and W. Adam, of Glasgow, will, it is said, cost about 8,000*l.*

THE NINE-HOURS MOVEMENT.

MEETING OF WORKMEN.

ON Wednesday evening last a very numerously-attended meeting of the building trades was held at Exeter Hall, for the purpose of aiding the progress of the "nine hours movement." The great hall, the galleries, and the platform, were densely crowded.

The chair was taken by Mr. Osborne (plasterer), who opened the business of the evening by stating that the meeting had been called to give the aggregated trades an opportunity of showing their disapprobation of the resolutions passed by the meeting of master builders, held at the Freemasons' Tavern on the 20th of last month. At that meeting certain resolutions were passed to the effect that no sufficient reasons had been shown to warrant the employers in conceding nine hours as a day's work. The trades were advocating nine hours in order that employment might be given to thousands who were now walking the streets in search of work, in order that those who were in work might be afforded an opportunity for that ease and recreation necessary for the maintenance of health, and in order to enable them to educate their children, and thus make them useful and creditable members of society. These were a few of the reasons why the trades advocated the nine hours. The true reason why the employers refused to concede the nine hours was that they might continue to oppress, tyrannize, and trample the workpeople under their feet, and make them mere machines, and drive them at their pleasure. The wording of their resolutions at the Freemasons' Tavern showed that they placed the labour of the artizans below that of machinery, plant, or cattle. This was the reason why employers refused to concede the nine hours. Would they allow this insult to pass away? Was it not to the skill, patience, endurance, and heroism of the working-classes that England owed her present elevated position among the nations of the world? Why, then, should they not gather round the standard of the nine hours, and show their employers that they were determined to carry the movement to a successful issue? One of the speakers at the employers' meeting described the order to which he belonged as a "rope of sand," whereas they ought to be tied together by a band of iron. The working-classes were determined to adopt that recommendation, although it was not intended for them. They would unite and knit together like a band of steel, and the fire that would flash from it would show their employers the temper of the metal, and the unity and strength which formed the chain.

Mr. Gray (stone-mason) moved the first resolution, and expressed his regret that the employers who met at the Freemasons' Tavern were not sufficiently influenced by the spirit of Christianity and humanity to concede the nine hours. A deputation of the trades had waited upon them to ask permission to attend the meeting, and hear what was to be said; but they refused to allow them. He charged a portion of the public press with being indifferent to the interests of the working man, whilst its columns were always open to the representations or misrepresentations of the employers. He called upon them, however, to persevere in the movement so happily inaugurated, remembering, in the words of the poet, that—

> "Freedom's battle oft begun,
> Bequeathed from bleeding sire to son,
> Though baffled oft, is ever won."

In reply to the resolutions of the Freemasons' Tavern meeting, they said the hours of labour, as now arranged, are not convenient. He wished to know whether the working-classes had ever been consulted when the present hours of labour were fixed. The amalgamated tradesmen now, however, determined to have a voice in the matter, by reducing the hours of labour from ten to nine hours. He saw no reason why the employer, or the public, should object to this. There were thousands of persons wandering about the streets seeking employment, and if the hours of labour were shortened that evil would be remedied. It had been said that what the trades wanted was increase of wages. This was not so; all they wanted was to have the day's work shortened by one hour per day. He did not see how any Christian employer, or any one who had labour to pay for, could object to a proposition which, while it tended to ameliorate the condition of the working man, would find bread to thousands who were now wanting the common necessaries of life. He hoped the trade would not be such cravens as to go back from their determination in this respect. There was no going back now. That was impossible—forward! must be the cry. At Todmorton, in Yorkshire, the employers were willing to reduce the hours of labour from ten to nine hours: and an advertisement had been inserted in the local papers to the effect, that from and after the 1st of June next, one hour should be struck off the day's labour. One of their most considerate employers had objected at the builders' meeting, to concede the demands of the trade on the ground that it would be a serious disturbance to "plant, machinery, and cattle labour," thereby excluding from their category man made after the image of God. He denied that the concession would amount to 10 per cent. It was the surplus labour they were afraid of, and not the 10 per cent. the public might have to pay. Mr. Dunnap told the meeting that an hour and a half had been taken off the Saturday, while 10 per cent. had been added to wages, thereby enabling the skilled workman to earn 33s. per week. This was all very well, but had the masters taken off the hour and a half until driven to it by strikes? The employers had them up at the Old Bailey four times, on the ground of conspiracy; but they refused to prosecute them, and they were discharged without entering into their own recognizances again. But all the employers did did not take off the hour and a half unconditionally—George Myers did not do so. With regard to the increase of 10 per cent. to wages in 1853, allowance was made for it in the architects' estimates, so that the public paid for it, and not the employer. Moreover, there were some employers who took the benefit of it in the architects' estimate, and yet defrauded the poor workmen of it. He cordially seconded the resolution, and recommended them to take for their watchword—the nine-hours movement, and no surrender.

The resolution was in the following words:—

"That this meeting views with regret the position assumed by the master builders, and the unjust principles laid down in their resolutions. Looking at the movement in its pecuniary aspect, they affirm that the present arrangement of hours is the most convenient to all parties, entirely ignoring the evils of surplus labour and physical exhaustion, arising from the present system, and placing us, in their consideration, below machinery, plant, and cattle labour. The assertions of taxing the public more than 10 per cent. conceding the hour and a half on Saturday, and the 10 per cent. in 1853, are specious statements put forth to mislead the public, and place us in a false position."

Mr. Giffard (bricklayer) seconded the resolution, and referred to the circumstance that a deputation from the trades had asked to be allowed to hear the proceedings at the meeting at the Freemasons' Tavern, and they were refused. This showed that their cause was not right and just. Mr. Charles Lucas moved a resolution at that meeting to the effect, that the nine-hours movement was not one which called for the sympathy of the public, and yet the public were invited to join in a movement to get a half-holiday for bankers' clerks and others, who went to business at ten o'clock in the day and left off at four. But in point of fact, the employer got twelve hours' labour out of the working man instead of ten, because the poor man could not fix his residence close to his work, and nearly two hours were lost in going to and from work each day. The masters appeared to be careful about their horses, their plant, and their machinery, but with regard to the human machine that had a future to look to, he cared nothing for it, and a man might starve before a master would do anything for him. Mr. Myers was said to be one of the best employers among the master builders, and yet he discharged from his employment some of the delegates, because they had gone round collecting subscriptions for the Nine-hours Movement. The next thing he did was to second the first resolution at the Freemasons' meeting. Mr. Lee had declared that the men earned 5s. 6d. a day, or 33s. per week. He (Mr. Giffard) denied this, as, with the exception of a few men in shops who earned 5s. 6d. a day, the vast majority made only 25s. or 27s. a week, while some had only 18s. a week. The bricklayers, for instance, were dependent upon the weather; and it was very rarely that they earned 33s. per week, from Christmas to Christmas. One of the speakers at the Freemasons' meeting had spoken of a band of iron. The bricklayers were determined to act as a band of iron in favour of the Nine-hours Movement; and they would not rest until they got it. He called upon the five

amalgamated trades to stick together, and go for the nine hours. Mr. Morris had told them, at the Freemasons' meeting, that, with regard to the men, he would be harmless as a dove, but cunning as a serpent. That the masters were the latter, there could be no doubt, as they had printed and circulated a lot of lies, to show that they were doves, and the trades as cunning as serpents. Did they know that, while Mr. Morris proclaimed at the meeting that he gave 5s. 6d. a day to his own workmen, he was only giving 5s. and that when they threatened to strike, he said, "Don't strike, and you shall have the 5s. 6d." and they had it.

Mr. Quirk (plasterer) supported the resolution and said, that until the proceedings of the meeting at the Freemasons' Tavern were made known, the trades could not ascertain what course they ought to pursue. That uncertainty was now at an end; and the employers had declared that they would not concede the demands of the trade. They had placed the workmen below machinery and plant, and looked upon them as mere manipulating machines of bone and muscle, to toil and slave for the benefit and enjoyment of the more favoured classes. Some of the largest employers of the present day had sprung from the working classes, and yet they now denied the moderate and reasonable demands of them. Suppose the masters were to strike against the workmen, would not the workmen co-operate together for their common ends? When the population was redundant and in excess of labour, the well-being of the working classes was imperilled. To meet this evil the trades called for a reduction of one hour per day, with the wages to be continued at the present scale. He supported the resolution, and called upon the meeting to remember the sublime and philosophical maxim, that "God helps them who help themselves."

> "Thrice is he arm'd whose cause is just;
> And he but naked, though lock'd up in steel,
> Whose conscience with injustice is corrupted."

The motion was then put from the chair and carried unanimously.

Mr. Ward (mason) said the great question was to lay down a straightforward policy for the future, so that the employers and the men might not be marching up and down like the Austrians and the French on the banks of the Po, afraid to attack each other. He wanted to see some definite course proposed.

Mr. George Potter (joiner) moved the second resolution, as follows:—

"Seeing that the employers have refused to concede the nine hours as a day's work, giving as their reasons, first, 'that in all probability it would lead to a reduction of the hours of labour in other trades, and establish a dangerous precedent throughout the country; secondly, that there is no sufficient reason at the present time to justify such an advance as is demanded by what is called the nine-hours movement,' this meeting is of opinion that such allegations are not sufficient to deter us from prosecuting our claim, and we pledge ourselves to use the whole of our energies, mental and moral, in the present struggle, and if need be, use the last resource for the purpose of bringing the movement to a successful termination." All interested in the labour question, he said, knew the object of the present movement. The law of labour was the law of God and nature. Surely, then, they should infer that man was not born for inactivity. The body was formed for exertion, and therefore they could not afford to escape the common lot. At the same time respect should be paid to labour, and opportunity should be given for recreation and amusement. The book which enjoined the servant to obey his master, also said honour all men—honour the sons of labour as well as the princes of the earth. They were met that night to ask for an abridgement in the hours of labour. They did not object to work—they objected to slavery, and he contended there was something terribly wrong in an age when everything progressed except the working classes. If the people were enlightened, the nation would be enriched, but how could the people be enlightened as long as they were kept in slavery by excessive hours and excessive labour? Let the artizan and workman have his place in society, and then the people would be contented and happy. The nine-hours movement was an important aid to civilization. It was at first looked upon with apathy, but now the five trades were amalgamated, and although they were determined to carry their object, they had no desire to retrench the profits of the masters, or to add to their own earnings. Their first object was to afford employment to the thousands who were now seeking it in vain; and, secondly, to ameliorate their social sondition, and enable them to elevate themselves to the position of citizens of a free country. The resolutions passed at the meeting, held at the Freemasons' Hall, were meagre, narrow, and selfish. The object of the employers was not to see how they could give the nine hours, but to combine together to see how they could refuse them. But when the employers said there was no precident for conceding the nine hours, did they not know that at Oldham, in Lancashire, the building trades worked only fifty-one-and-a-half hours a week? and did they not know that at Todmorden, in Yorkshire, the masters had consented to give the nine hours from and after the 1st of next month? The sooner, therefore, the London employers made a precedent for themselves the better. Another reason which demanded the concession of the nine hours, in addition to that of health, was recreation. The only fortune the poor man possessed, was his health, and it was impossible to preserve that without rest and recreation. If the present was not a convenient time for conceding the nine hours, why did not the employers say so? If they had said that, in consequence of existing contracts, it would be hurtful to them to give the nine hours at once, the trades would cheerfully wait until existing contracts had run out. He did not believe that the trades were disheartened by the resolutions of the master builders. Let them remember, that although the masters had held themselves up as philanthropists, no newspaper in the kingdom had written a leading article approving of their course. The master builders had thrown down the gauntlet, and the trades were bound to take it up. Let them be unanimous. Subscribe a small sum—but a penny a week; call meetings in societies and shops, and devote their whole moral energies to the accomplishment of the object. If that did not do, they had the last resource, a death-blow to the business of many of the masters, and a long train of evils to many of the men. The men knew what strikes were; they had looked them in the face before, and were prepared to do so again. But the men did not wish to do this, if the masters would act like Christians, and consider the question at issue. If they would not, let them buckle on their armour, and if every man did his duty the victory would be theirs.

Mr. Grant Facey (a painter) seconded the resolution, and denied that the resolutions passed at the Freemasons' Tavern contained a fair statement of the case, as the present arrangement of the hours of labour were not "the most convenient for all parties." They were not convenient to the building trades, or hence the present movement. The masters took great credit to themselves for standing between the public and the workmen, to prevent the former paying 10 per cent. more on their contracts; but although they were so very conscientious in regard to the 10 per cent. they forget to say that when, in 1853, materials advanced 20 per cent. and subsequently went down again, they still continued to charge the public the 20 per cent. In conclusion, he denied that Mr. Abbot had vindicated himself, in the *Builder*, from the charge of having made a false statement with reference to the Rev. Mr. Cadman having refused to give his pulpit in favour of the Nine-hours Movement, as that gentleman had emphatically denied that he had said anything of the kind.

The Chairman was about to put the resolution, when

Mr. John Petty (house-painter) moved, as an addendum, "That this meeting give it as an instruction to the conference to avoid all antagonism to the employers, and to proceed in organizing, not only society, but non-society men also in London, and to open communication with the large provincial towns."

Mr. Davis seconded the proposition.

Mr. Glazier, a carpenter, supported the amendment, as he considered it absolutely necessary that they should show the world that they were prepared to act with moderation and discretion. With the prospect of being dragged into a European war, he thought it would be foolish to attempt to play the bully, and put themselves in an attitude of hostility with the employers.

Mr. Potter said that an address to the trades in the country was ready for the printer, and that as far as organization was concerned, repeated meetings had been held for that purpose, and that as many non-society men had joined this movement as society men.

The amendment was then put, but not a single hand was held up in its favour.

The original motion was next submitted and carried amid immense cheers.

A vote of thanks to the chairman, and three cheers for the nine-hours movement, concluded the proceedings, which were of a very orderly description.

LYNN SAVINGS BANK.

THIS building, now just completed, consists of entrance lobby, waiting-room, and bank (which communicate with each other), and retiring-room and lavatory on the ground-floor. A staircase near the entrance leads to the committee-room, which is situated over the waiting-room.

Externally, the front is composed of red brickwork, with dressings of Casterton stone. The style adopted is English Domestic Gothic of the fifteenth century. The area in front of the bank is inclosed with wrought-iron railings and gates. The interior is carried out in the style of the period. All the timbers in the ceilings show, and are moulded; and the chimneys are of Caen stone, elaborately carved.

The contractor for the whole of the building was Mr. Bennett, of Lynn. The stonework was executed by Mr. Bone, and the ironwork by Mr. Page, both of the same town. The architects were Messrs. Medland and Maberly, of London and Gloucester.

DRINKING-FOUNTAIN MOVEMENT.

A FOUNTAIN, named the Victoria, has been opened at Brompton, Kent, by Lady Smith, the wife of Sir Frederick. It is in the shape of a bronze pillar, with two galvanized ladles to drink from, and a small place at the bottom for dogs, &c. The water is supplied free, from the mains of the Brompton and Gillingham Water-works Company. The water issues from a lion's mouth when a small copper ball on the top of the fountain is slightly pressed.——The borough of Warwick has been presented with two fountains—one by Mr. E. Greaves, M.P. and one by Mr. R. Greaves. One will be erected near the East and the other near the West Gate Chapel.——At Coventry the Temperance Society is soliciting subscriptions for a fountain to be erected in front of Bablake Church. It is to be 16 feet in height, and the plan has been approved of by the local board of health. Mr. T. Pratt is the architect. The town council have attached ladles to the public pumps.——At Barnstaple Sir William Fraser, M.P. has contributed 50*l.* for the erection of a white marble fountain, in any part of the town which the corporation may consider most suitable.——The Sheffield council have confirmed the minutes of a committee of their body to the effect that drinking-fountains in various parts of the town would be very useful and convenient to the working classes, and prove eminently conducive to health, comfort, and temperance. A sub-committee was appointed to consider what would be suitable sites, the most proper description of fountains, with the cost of erection and of maintenance, with the best means of defraying the cost; also to solicit co-operation and assistance. A vote of thanks was passed to the following persons, who have agreed to erect fountains at their own expense:—Messrs. Edwin Smith, Thomas Youdan, Jos. Barstow, J. H. Sales, and the teachers and scholars of the Red-hill school.——Mr. Howard, of Greystoke, has offered to erect a drinking-fountain in Penrith, if the health committee will supply the water. The offer has been accepted.——A drinking-fountain, the gift of the Rechabite Society, is about to be opened at Whitehaven.——A drinking-fountain is about being erected in the centre of Golden-lane, London, from a fund raised by the inhabitants, under the auspices of the Rev. W. Rogers and the Rev. B. Holmes, the clergy of the district of St. Thomas Charterhouse, from the design of Mr. Thomas J. Hill, architect.

HARBOURS OF REFUGE.—SEA-WALLS.

IN page 649 of your fifteenth volume, I alluded to the accumulation of mud at the mouth of the Thames and off the Essex coast, and suggested the conversion of these banks into land. Your description of Dover Harbour of Refuge and the remarks of a correspondent appearing in the same number (848, May 7), have induced me to revert to this subject.

The shoals off the coast of southern Essex, called "Maplin Sands," extend many miles into the sea: beyond them is a broad channel or strait called "East Swin," and then an insular sand-bank known as the "Flat of the Barrows:" besides these are smaller banks divided by shallow straits, the whole compassing an extent of sea-bed equal in size to the county of Middlesex.

This, of course, must render navigation difficult and dangerous, and the formation of harbours of refuge desirable; and, at this part of the coast, as above described, the soil taken from between the banks to afford sufficient depth to form the harbours could be thrown into enclosures of sea-wall constructed upon the higher levels, so as to form additional land on the coast and artificial islands off the coast.

W. SCARGILL.

A QUERY AS TO FOUNDATIONS AND ASPHALTE.

SIR,—Will some of your correspondents inform me whether asphalte is largely used in England for foundations in place of large stones, and, if it is, with what success? It might be interesting and instructive if any of your readers would give, through your columns, their experience of its efficiency, and any experiments of its power of resistance to a crushing force, as well as to a cross strain, they may have made.

In a case that came lately under my observation, where the soil was treacherous, a trench of about 4 feet in width, and 3 feet 6 inches in depth, was dug: into this trench was rammed 2 feet of concrete: upon the concrete pounded slag was laid to a depth of 6 inches, and bitumen was run over it: two more layers of the same thickness, but of a less width, were laid in the same manner; and upon this foundation the stone and brick walls were erected.

It seems to me that an asphalte foundation, properly made and protected by a covering of soil from the weather, has two advantages: there being no break or bond, the weight of the structure is spread over a large space, and also damp is prevented from coming up the walls.

I should like to know, however, something as to its durability and power of resisting a crushing force.

C. E.

EAST SUFFOLK HOSPITAL.

SIR,—Will you be kind enough to lend your powerful aid to assist me, who am powerless alone, to do a necessary work in a sanitary point of view? You have said and done much respecting the unsanitary state of our barracks and public hospitals. We have one in Ipswich, called the East Suffolk Hospital, built and supported by voluntary contributions. Myself feeling that such a thing was needed, I was among the first that placed my name on the subscription list as an annual subscriber ere it was built. Feeling still an interest in the establishment of such a boon for suffering humanity, no acrimonious word of feeling will I express, or a selfish wish, to gain my own ends, but solely to benefit patients, who, ignorant of the cause of their sufferings after they have been cured of the one malady for which they entered the sick ward, leave the hospital worse than when they entered, the one disease excepted. I know one patient who went in to be cured of a lameness. He was full fleshed, and otherwise strong: his disease was called chronic rheumatism, of which he was cured, and dismissed, but he was so weak that he could scarcely walk home a mile's distance. After resting himself several times, he gained his

home at last, completely exhausted, went to bed, and kept it for three weeks after. It is evident that there must have been some cause for his emaciated state, and he, as well as myself, attributes it to the unsanitary state of the ward, there being no proper ventilation. The ventilation is, like that of a pair of barn doors, thrown open every morning before the matron, doctor, or visitors are admitted; so to them nothing noxious assailed their olfactory nerves. Thus they are, or were, perfectly ignorant (wilfully ignorant are they now that I have enlightened the understanding of the president, a director, and a doctor,—the medical M.D. under whose care the patient in question was placed). Another counteracting influence upon the medicine given was the "overdoing" the bread with "alum." Of this I have informed the gentlemen before mentioned. The nurse in the same ward—a young, strong, hale person—is, to her own knowledge, injured, and suffers much from the same cause, although she has the opportunity to leave the scene of her labour. Not so the patients. They know no change till they leave altogether. The bed of the patient I have more especially alluded to was directly opposite the principal entrance to the ward. The door and windows thrown open, there was a continual stream of cold air, amounting at times almost to a hurricane, pouring past him from a long passage and staircase; and he was continually receiving fresh cold, which cold became a settled influenza, which continued for months after he left, and reduced him all but to a skeleton, and extreme weakness in consequence. Others are affected more or less in the same way. Now, as the proper officers are informed of the real state of the case and take no heed, it becomes the cause of the public, or the patrons' and subscribers' business, to see to it, that it be attended to. I must inform you that in the erection of the building there was no architect employed. With the knowledge of ventilation as now applied to public buildings by those who study the sanitary question, however, it would cost but little to make it comparatively sanitary. "A prophet is not without honour, save in his own country." A voice from a distance will, per chance, arouse them to action. It is the public's and subscribers' work to urge the officers to action in the right direction for the benefit of poor suffering humanity. AMICUS.

THE SMOKE NUISANCE.

ECONOMY OF FUEL.

IN a country where there is much good sense, and no want of motives of frugality, it is astonishing to find, considering the obvious utility of patent fuel, in the form of coal-balls or cakes, that there should be no attempt made to adopt them, as they are well suited to augment the comfort of the humblest hearth.

I subjoin a few formulæ: "for furnaces or other large fires, the quantity of sea coal is to be increased:"—

1. Two-thirds of soft mellow clay, free from stones, and one-third coal-dust; or a ton weight of such clay worked into three or four bushels of small sea coal, previously sifted, and formed into cakes or balls about 4 inches in diameter, then thoroughly dried.

2. Equal parts of coal, charcoal, and clay, with finely-broken coke; the coal and charcoal being reduced to a fine powder, well mixed and kneaded together, with the clay moistened in water; then formed into small balls, the size of an egg, and dried. (A certain quantity of straw, cut very small, or of chaff, or even cocoa-nut and almond-shells, or sawdust, may be advantageously incorporated.)

3. Where clay cannot be procured, cow or horse dung, road or street mud, sawdust, turf, straw, and particularly tanners' waste; to which may be added broken pulverized glass, pitch, tar, oil-cakes, or other combustible matter.

J. B. NEIL.

ACTION FOR DAMAGE THROUGH INSUFFICIENT SHORING.

Wish v. *Browne and Another.*—In the Court of Common Pleas, on Tuesday last, the plaintiff claimed damages upon the ground that a public house, called the Golden Fleece, in Little Knightrider-street, of which he was the occupier, had been injured in the course of pulling down an adjoining house. The defendants, who were builders and contractors, had been employed to do the work.

Mr. Serjeant Tozer and Mr. Prentice appeared for the plaintiff, and Mr. Hawkins and Mr. Barnard for the defendants.

The plaintiff took the Golden Fleece, which was then a shut-up house, in March, 1858, and paid altogether 120*l.* of which 50*l.* was for good-will. About the beginning of July his receipts amounted to 30*l.* or 35*l.* a week; but, shortly after that time, the defendants began to pull down the adjoining house—the Old Parr's head. The plaintiff's case was that in doing this they had not sufficiently shored up his house, in consequence of which it had sunk, and leaned over in the front 4½ inches, and at the back 19 inches, and it became dangerous. On the 13th of August there were a dozen gentlemen dining on the first-floor, but just as the cheese was served the house sunk again, and a quantity of rubbish fell down, which so alarmed them that most of them ran away, and several never went into the house afterwards. In the course of pulling down the Old Parr's Head, Mr. Smith, the district surveyor, and Mr. Hersey, his assistant, saw the premises, and they thought that the plaintiff's house was not sufficiently shored up. At their request the defendants put up additional shoring.

For the defendants a great many of their workmen were called, and they were all of opinion that the shoring had been done in a careful and skilful manner. Before any attempt was made to pull down the Old Parr's Head upright timbers were put on all the floors of the Golden Fleece from bottom to top: there were also some horizontal shores back and front; and raking shores were put up the side as soon as possible. The truth was that the Golden Fleece was a very old house: there was a crack of ancient date running down the front at its junction with the next house, and all the main timbers were rotten.

Mr. Hudson, the defendants' surveyor, expressed his opinion that the shoring had been properly done at first, and that the additional shoring advised by the City surveyor was not at all necessary.

Mr. Justice Byles left it to the jury to say whether the defendants had used due, reasonable, and proper care in pulling down the party-wall and propping up the plaintiff's house; and if the defendants had not used due, reasonable, and proper care, then what consequent damage the plaintiff had sustained.

The jury found a verdict for the plaintiff—damages 50*l.*

Books Received.

Designs for Villas, Parsonages, and other Houses. By S. HEMMING, Architect, Leamington. London: Thompson and Co. 111, Strand.

IF we could have given this book any higher praise than that of presenting clearly, with specifications, a certain number of ordinary types, we should have mentioned it long ago. It consists of forty plates; nine of them printed in colours by the chromo-lithographic process, selected, the author says, from designs made for many houses built during a practice of more than twenty years. "Being a series of designs not intended for publication, but prepared for buildings which have been erected; and having, therefore, been adapted to the wants and means of the parties building, they are more likely to meet the requirements of the public in general, than any collection of mere designs, however carefully prepared." The author says,—

"To the architect, it is hoped the work may be useful as a book of reference, from which he may see at a glance *about* what accommodation may be afforded for a given amount; and may thereby sometimes be spared the necessity of preparing a second series of drawings, in order to meet a fixed sum; thus saving his client a charge which is seldom paid willingly or received with pleasure.

To the builder, it will offer a greater choice for selection than may at first sight appear; as it is (and especially to non-professional persons) much easier to alter and adapt plans and elevations than to make an original design.

To the general public, who may contemplate building, it will form a safe guide as to accommodation and cost, and may thereby enable those who do not choose to *adopt* any one of the designs, to make up their minds as to what they can obtain for a fixed amount, and so to give more definite instructions to their architect than they otherwise would be able to do; an advantage those will best appreciate whom experience has taught how frequently cost is incurred wastefully from indefinite instructions, to the disappointment of the employer and vexation of the employed."

The designs range as to cost from design No. 1, which consists of plans and elevations for two small houses, containing two sitting-rooms, three chambers, one attic, kitchen, cellars, closets, &c. &c. and costing each 200*l.* to design No. 12,—plans and perspective view of a large house in the Gothic style, built with brick and stone dressing and enrichments, and containing large dining-hall, 45 feet by 20 feet; breakfast-room, 34 feet by 20 feet; entrance and vestibule, library, study, strong closet, two drawing-rooms, each 30 feet by 20 feet, &c. &c. and costing 5,500*l.*

On the Construction of Breakwaters for Harbours, similarly situated as the one at Dover Harbour. By Charles Burn, C.E. London: Weale, 59, High Holborn. 1859.

THE method proposed by Mr. Burn is one by which, as he maintains, a breakwater for such a site as that of the Dover Harbour of Refuge could be made in one-seventh of the time, and at less than one-half the cost of that now in progress.

"We propose," he remarks, "to construct the breakwater by a series of isolated circular towers, 50 feet in diameter and 70 feet high, constructed entirely of brickwork, concrete, and masonry; the towers to be built at intervals varying from 5 to 15 feet, connected on the top only by an iron gangway and parapet.

As a means for practically carrying out such a principle of breakwater, we propose to adopt Bentham and Ashton's system of construction.

The foundation of each tower, or that portion from the bottom up to five feet above low-water mark, is a casing, constructed of brickwork in cement with a granite ashlar facing, forming a circular wall five feet in thickness. This hollow casing or cylinder is built upon a timber platform, calked water-tight, and made sufficiently strong to withstand the pressure of water when the casing is sunk to its floating level.

The hollow foundations may be towed to their position in the line of breakwater, and when in position, a valve in the timber platform can be opened, the water let in, and they will sink in position and become fixed.

The centre portion can then be filled in with concrete.

Having thus made the foundation to a height of five feet above low-water, the superstructure above that point can be constructed in the ordinary manner, with concrete blocks for hearting and granite blocks for facing. The top to be paved with granite blocks or Portland stone.

These towers may then be connected together by a cast-iron gangway and parapet."

Such is a brief outline of the plan. The breakwater, instead of being a continuous structure as at present, would be composed of a series of disconnected towers, averaging 10 feet apart. This reduces the quantity of material, it is said, nearly one-fourth, though equally strong and durable as if solid; and will break the force of the waves, and cause still water in the harbour as efficiently as a continuous breakwater.

No coffer-dams, of course, will be necessary in constructing such foundations as those described.

A Guide to Typography, Literary and Practical: or, the Printer's Handbook and the Author's Vade-Mecum. By Henry Beadnell, Printer. London: F. Bowring, 211, Blackfriars-road. [Nos. 1 to 7 inclusive.]

IN the outset of this serial treatise we expressed our opinion of the ability and experience of the author, and our conviction that the whole work would prove worthy of the public patronage, as well as of the author himself. It is now more than half completed; and it is but doing bare justice to the book to say that it fully justifies all we wrote, and shows its author to be a thorough master in the "noble art" and science of typography, in its most comprehensive sense. There has hitherto been a decided want of some criterion in modern printing, to which all persons, printers especially, as well as authors, might be willing, from its adequacy, to refer all differences or disputes, such as militate so much against the general harmony, consistency, and unity of our typographical products; and we much mistake the merits and the destiny of Mr. Beadnell's valuable and scholarly treatise, if *it* do not prove eventually to be the so much required criterion. Such a result would itself repay him for all the labour of love so evidently expended on it.

Theory of Compound Interest and Annuities with Logarithmic Tables. By FEDOR THOMAN. London: Weale, Holborn. 1859.

IN questions of compound interest and annuities which require accurate solution, the great value of logarithmic computation is clearly shown. Where the questions are intricate, numerical tables are of little use. Mr. Thoman has had large experience in advising a foreign financial company, and has acquired peculiar skill in laborious computations. The tables which are appended to his treatise show:—

"1. The amount of 1*l.* at the end of any number of years.

2. The reverse, viz. the present value of 1*l.* due at a given time.

The second column gives:—

3. The annuity which purchases 1*l.*

4. The reverse, viz. the present value of 1*l.* per annum.

Both columns combined give directly:—

5. The amount of an annuity in arrear.

6. The reverse, viz. the annuity in arrear which amounts to 1*l.*—the amortizement.

7. The amount of annual investments.

8. The reverse.

9. The present value of a deferred annuity.

10. The reverse.

The second and third Tables are complementary; the second for fractional years, and the third for such rates as are not included in Table I.

Table IV. shows the logarithms of annuities when the interest and annuity are not paid within the same intervals of time."

It is a valuable work for the advanced student.

The Timber Merchant's and Builder's Companion. By WILLIAM DOWSING, Hull. London: Simpkin and Marshall. 1858.

THIS is a very useful set of tables for contractors, carpenters, and all who deal in timber. In table 2, the reduced weight or Petersburg standard measure, is calculated and given of all sizes of deals and battens, from 1 to 1,000. For example—sixty deals, 21 feet long, 3 inches thick, and 11 inches wide, is precisely 1c. 3q. 0odd. as shown in the table; thus at one glance it can easily be ascertained what is the precise weight or measurement of any quantity, size, or description of foreign deals, &c.

Table 3, gives the exact price per Petersburg